Vol. 917 Number 2

OFFICIAL GAZETTE

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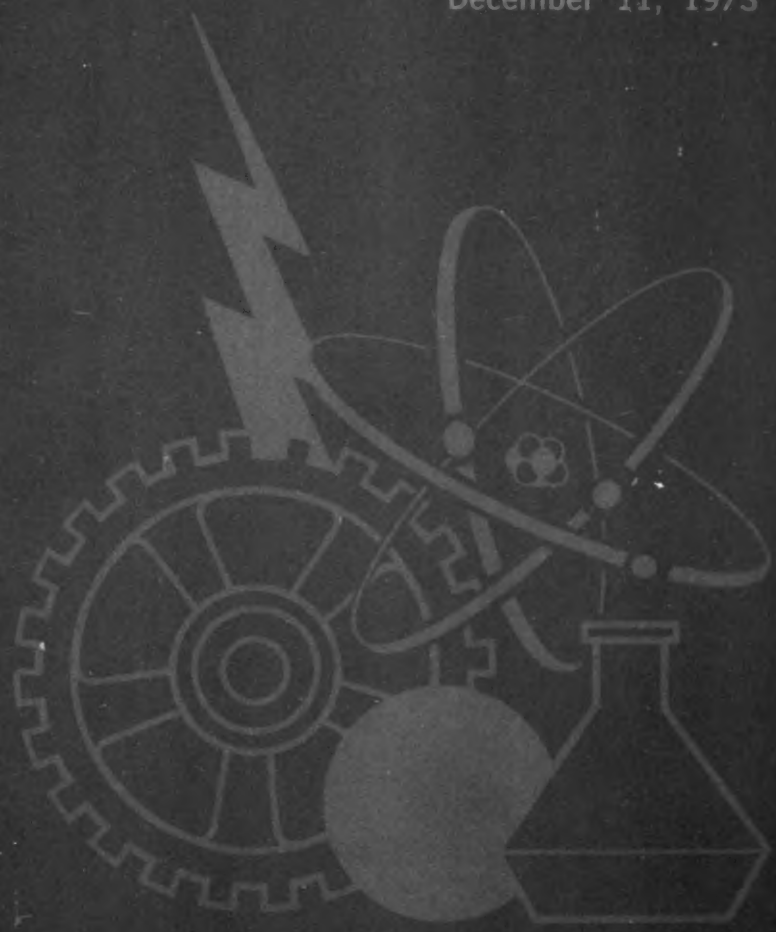
A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

December 11, 1973



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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

December 11, 1973 Volume 917 Number 2

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PATENT NOTICES

Certificates of Correction for the Week of Dec. 11, 1973

Re. 27,737	3,727,560	3,736,624	3,745,653
Re. 27,738	3,727,647	3,736,627	3,745,664
D. 227,150	3,727,652	3,736,635	3,745,710
3,494,469	3,727,715	3,736,654	3,745,827
3,515,634	3,727,879	3,737,092	3,745,932
3,517,514	3,727,900	3,737,119	3,746,055
3,572,010	3,728,334	3,737,386	3,746,401
3,607,691	3,728,399	3,737,408	3,746,452
3,642,679	3,728,503	3,737,429	3,746,562
3,644,301	3,728,646	3,737,631	3,746,684
3,653,607	3,728,651	3,737,657	3,746,726
3,668,185	3,728,690	3,737,735	3,746,934
3,668,251	3,729,915	3,737,748	3,747,112
3,669,128	3,730,037	3,738,485	3,747,164
3,672,924	3,730,247	3,738,885	3,747,364
3,676,226	3,730,298	3,738,895	3,747,437
3,679,752	3,730,303	3,739,302	3,747,548
3,681,397	3,730,424	3,739,314	3,747,596
3,685,594	3,730,462	3,739,323	3,747,608
3,686,084	3,730,955	3,739,500	3,747,747
3,687,851	3,731,297	3,740,133	3,747,884
3,689,300	3,731,603	3,740,204	3,747,930
3,689,440	3,731,880	3,740,209	3,748,525
3,692,898	3,732,058	3,740,263	3,748,936
3,694,619	3,732,195	3,740,573	3,749,135
3,696,084	3,732,234	3,740,843	3,749,320
3,697,253	3,732,308	3,741,095	3,749,468
3,697,587	3,732,465	3,741,254	3,749,674
3,699,223	3,733,318	3,741,289	3,749,848
3,700,011	3,733,355	3,742,235	3,749,863
3,701,901	3,733,361	3,742,564	3,749,912
3,703,226	3,733,366	3,742,676	3,750,037
3,705,165	3,733,395	3,743,009	3,751,154
3,705,642	3,733,433	3,743,040	3,751,312
3,708,935	3,733,476	3,743,049	3,751,425
3,709,087	3,733,866	3,743,168	3,751,812
3,709,897	3,734,070	3,743,226	3,752,213
3,710,867	3,734,117	3,743,423	3,752,428
3,712,107	3,734,245	3,743,443	3,752,740
3,713,030	3,734,544	3,743,464	3,752,772
3,714,476	3,734,563	3,743,488	3,753,084
3,714,962	3,734,582	3,743,534	3,753,311
3,715,230	3,734,600	3,743,558	3,754,460
3,716,154	3,734,733	3,743,724	3,755,184
3,717,858	3,734,760	3,743,762	3,755,197
3,718,848	3,734,914	3,743,791	3,755,276
3,719,322	3,734,963	3,744,092	3,755,456
3,720,646	3,735,078	3,744,261	3,755,566
3,721,636	3,735,164	3,744,585	3,755,816
3,721,960	3,735,298	3,744,655	3,755,915
3,723,108	3,735,393	3,744,682	3,755,967
3,723,604	3,735,579	3,745,173	3,756,194
3,723,827	3,735,642	3,745,275	3,756,272
3,724,185	3,736,151	3,745,307	3,757,113
3,724,422	3,736,156	3,745,335	3,757,258
3,725,221	3,736,304	3,745,337	3,757,390
3,726,248	3,736,305	3,745,426	3,757,526
3,726,924	3,736,326	3,745,500	3,758,936
3,727,399	3,736,334	3,745,536	3,760,261
3,727,411	3,736,382	3,745,629	

Disclaimers

Plant Patent 3,256.—*Walter H. Jessel, Jr.*, Doylestown, and *William E. Duffett*, Akron, Ohio. CHRYSANTHEMUM PLANT. Patent dated Aug. 15, 1972. Disclaimer filed Aug. 23, 1973, by the assignee, *Yoder Brothers, Inc.*

Hereby disclaims the single claim of said patent.

3,078,337.—*William J. Shanahan*, New York, *Vincent R. Zopf*, Floral Park, and *Albert M. Loshin*, Brooklyn, N.Y. METERING SYSTEMS. Patent dated Feb. 19, 1963. Disclaimer filed July 11, 1973, by the assignee, *Shiatron Electronics & Television Corporation.*

Hereby enters this disclaimer to claims 46, 47, 50 and 57 of said patent.

3,359,352.—*William H. Powell*, Livingston, and *Lawrence J. Friedman*, Fort Lee, N.J. PROCESS FOR PRODUCING DECORATIVE SURFACE COVERING. Patent dated Dec. 19, 1967. Disclaimer filed Aug. 24, 1973, by the assignee, *Congoleum Industries, Inc.*

Hereby enters this disclaimer to claims 1, 2, 4, 10, 13 and 19 of said patent.

3,454,210.—*Francis X. Spiegel*, Cedar Grove, N.J., and *Victor Monia*, Palo Alto, Calif. EASY OPENING AND RECLOSABLE PACKAGE, FILM THEREFOR AND PROCESS. Patent dated July 8, 1969. Disclaimer filed Sept. 4, 1973, by the assignee, *Standard Packaging Corporation.*

Hereby enters this disclaimer to claim 13 of said patent.

3,516,830.—*Thomas E. Whiteley*, Rochester, N.Y. PHOTOGRAPHIC SILVER HALIDE EMULSIONS AND ELEMENTS. Patent dated June 23, 1970. Disclaimer filed July 20, 1973, by the assignee, *Eastman Kodak Company.*

Hereby enters this disclaimer to all claims of said patent.

3,517,376.—*John C. Sarazen*, Mansfield, *John M. Pierini*, South Attleboro, and *Reidar G. Larsen*, North Attleboro, Mass. CONNECTOR FOR USE BETWEEN AN INTEGRATED CIRCUIT AND A CIRCUIT PANEL. Patent dated June 23, 1970. Disclaimer filed June 13, 1973, by the assignee, *Texas Instruments Incorporated.*

Hereby enters this disclaimer to claims 1 and 7 of said patent.

3,638,039.—*Vallon Wei-Loong Chen*, Edison, N.J., and *Hiroshi Amemiya*, Morrisville, Pa. OPERATION OF FIELD-EFFECT TRANSISTOR CIRCUITS HAVING SUBSTANTIAL DISTRIBUTED CAPACITANCE. Patent dated Jan. 25, 1972. Disclaimer filed Aug. 27, 1973, by the assignee, *RCA Corporation.*

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

3,666,243.—*Angelo J. Bisinella*, Niles, Ill. SAND MULLING OR CONDITIONING APPARATUS AND PLOW CONSTRUCTION THEREFOR. Patent dated May 30, 1972. Disclaimer filed Aug. 3, 1973, by the assignee, *Pettibone Corporation.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5, 6, 7, 8 and 9 of said patent.

3,685,899.—*John W. Reeds, Jr.*, Thousand Oaks, Calif. SEPARATION COLOR RECORDER SYSTEM. Patent dated Aug. 22, 1972. Disclaimer filed Sept. 12, 1973, by the assignee *Minnesota Mining and Manufacturing Company.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

Dedications

3,520,088.—*Alec Leibowitz*, London, England. GEM STONE POLISHING MACHINE. Patent dated July 14, 1970. Dedication filed Sept. 7, 1973, by the assignee, *Spectrum Diamonds (Proprietary) Ltd.*

Hereby dedicates the entire remaining term thereof to the Public.

3,527,946.—*Gordon Kramer*, Columbus, Ohio. SEMICONDUCTOR DOSIMETER HAVING LOW TEMPERATURE DIFFUSED JUNCTION. Patent dated Sept. 8, 1970. Dedication filed May 7, 1973, by the assignee, *The Battelle Development Corporation.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,534,510.—*Alec Leibowitz*, London, England. METHOD OF FACETING GEM STONES. Patent dated Oct. 20, 1970. Dedication filed Sept. 7, 1973, by the assignee, *Spectrum Diamonds (Proprietary) Ltd.*

Hereby dedicates the entire remaining term thereof to the Public.

PATENT EXAMINING CORPS

WILLIAM FELDMAN, Acting Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 24, 1973

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	11-03-72
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-11-72
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-08-72
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. L. LEAVITT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-28-72
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-17-72
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-18-73
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	12-07-72
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-08-72
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	7-07-72
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices, Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-18-72
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	2-11-72
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-17-73
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	10-10-72
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-05-73
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-11-73
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	9-21-72

Expiration of patents: The patents within the range of numbers indicated below expire during November 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C 283. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 2,772,415 to 2,775,761, inclusive
Plant Patents ..... Numbers 1,532 to 1,542, inclusive

REISSUES

DECEMBER 11, 1973

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

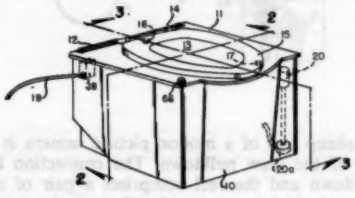
27,833
VEHICLE FLUSH TOILET

Thomas Carmichael and Durrell U. Howard, San Antonio, Tex., assignors to Sherwood Products Corporation, San Antonio, Tex.

Original No. 3,418,664, dated Dec. 31, 1968, Ser. No. 600,437, Dec. 9, 1966. Application for reissue May 5, 1971, Ser. No. 140,426

Int. Cl. E03d *5/016*

U.S. Cl. 4—115 19 Claims



The disclosure relates to a flush toilet for vehicles or the like. A storage receptacle receives waste from a bowl with which it communicates when an intervening shutter is open. During the flushing cycle, the shutter is closed and flushing fluid is pumped from a separate reservoir to the bowl and thence back to the reservoir, bypassing the receptacle.

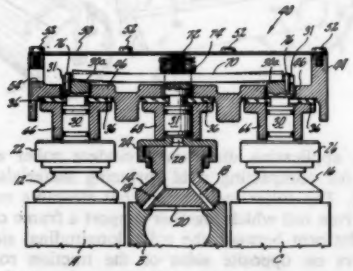
27,834
TRIPLE GOB SETTLE BLOWHEAD AND BAFFLE CONSTRUCTION

Francis A. Dahms, Tariffville, Conn., assignor to Emhart Corporation, Bloomfield, Conn.

Original No. 3,561,941, dated Feb. 9, 1971, Ser. No. 734,457, June 4, 1968. Application for reissue Sept. 2, 1971, Ser. No. 177,518

Int. Cl. C03b *9/00, 9/14*

U.S. Cl. 65—261 5 Claims



In the blank mold side of a triple gob Hartford I.S. Glassware Forming Machine Section, a settle blowhead and baffle carrier is provided for supporting three settle blowheads or baffles in depending relationship for movement into registration with corresponding openings in three individual blank molds. Two of the three baffles are slidably supported in the carrier for limited vertical floating movement and a single leaf spring urges these two baffles downwardly below the third so that as the baffles engage their respective blank mold openings, the spring is resiliently deformed to equalize the closing forces between all three baffles and their respective blank molds.

27,835
NONAQUEOUS ELECTROCHEMICAL CURRENT PRODUCING CELL HAVING SOLUBLE CATHODE DEPOLARIZER

Donald Leonard Maricle, Ridgefield, and Arthur Kentaro Hoffmann, New Canaan, Conn., by American Cyanamid Company, Stamford, Conn., assignee

No Drawing. Original No. 3,578,500, dated May 11, 1971, Ser. No. 743,005, July 8, 1968. Application for reissue Nov. 29, 1971, Ser. No. 203,083

Int. Cl. H01m *17/00*

U.S. Cl. 136—6 LN 8 Claims

A primary and secondary electrochemical cell which comprises in combination an anode of a metal capable of reducing a cathode depolarizer, sulfur dioxide alone or in a co-solvent, an electrolyte salt, and soluble depolarizers.

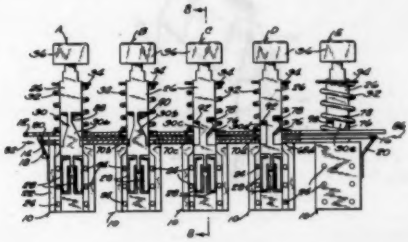
27,836
MULTISTATION PUSHBUTTON SWITCH ASSEMBLY WITH MASTER CONTROL MEANS FOR ALTERNATIVE PUSH-PUSH OR ONLY ONE SWITCH OPERABLE AT A TIME MODES OF ACTUATION

Eric George Hansen, Milwaukee, Wis., assignor to Globe-Union Inc.

Original No. 3,646,283, dated Feb. 29, 1972, Ser. No. 29,858, Apr. 20, 1970. Application for reissue Dec. 4, 1972, Ser. No. 311,861

Int. Cl. H01h *9/26*

U.S. Cl. 200—5 EB 14 Claims



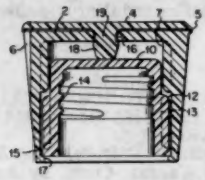
A multistation or ganged modular pushbutton switch assembly including a plurality of switch modules having a slider bar with a cam section and a push-push actuation mechanism thereon and separate latch bars cooperating with the cam sections so that some of the modules acting as operating modules can be controlled by master switch

modules to have either a push-push action, momentary action or are interlocked so that one must be actuated to deactuate the other.

27,837
PLASTIC SAFETY CLOSURE

James A. McIntosh, Upper Montclair, N.J., assignor to Mack-Wayne Plastics Co., Wayne, N.J.

Original No. 3,520,435, dated July 14, 1970, Ser. No. 787,695, Dec. 30, 1968. Application for reissue Feb. 9, 1972, Ser. No. 224,999
Int. Cl. B65d *21/00*
U.S. Cl. 215—9 4 Claims

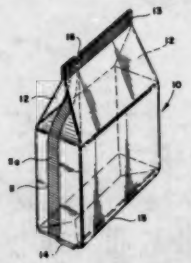


A plastic safety closure for threaded neck containers is described having an inner cap and an encompassing outer cap, each cap having engaging means, the engaging means being engaged for simultaneous rotation of the caps when the cap tops are in juxtaposition, and a plug associated with the outer cap capable of extending through the top of the outer cap to contact the top of the inner cap, thereby to maintain the cap tops separated and the engaging means in non-engaging relationship.

27,838
PACKAGE

William C. Leasure and John D. Andrews, Houston, Tex., assignors to Mira-Pak, Inc., Houston, Tex.

Original No. 3,458,111, dated July 29, 1969, Ser. No. 692,568, Dec. 21, 1967. Application for reissue July 21, 1970, Ser. No. 56,827
Int. Cl. B65d *33/38*
U.S. Cl. 229—17 R 18 Claims

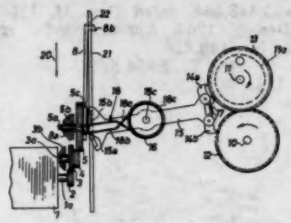


A package formed from a flat length of material, the edges of which length are connected together along a longitudinally extending seal. The package includes opposing gussets, one of which contains the longitudinally extending seal. The package is opened by separating the sides of the gusset and pulling the longitudinally extending seal, whereby the package opens and the gusset forms a pour spout. The bottom of the package may be flat.

27,839
MOTION PICTURE CAMERA

Friedrich Winkler, Unterhaching, and Kurt Thate, Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Original No. 3,570,783, dated Mar. 16, 1971, Ser. No. 808,385, Mar. 17, 1969. Application for reissue Feb. 29, 1972, Ser. No. 230,530
Claims priority, application Germany, Mar. 28, 1968, P 17 72 083.1
Int. Cl. B11b *15/32*; G03b *1/04*
U.S. Cl. 242—205 23 Claims

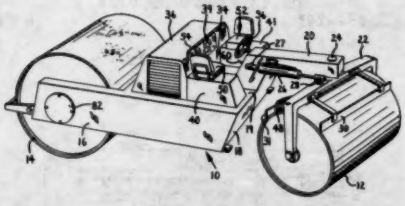


The takeup reel of a motion picture camera is rotated by way of the claw pulldown. The connection between the pulldown and the reel comprises a pair of meshing gears one of which is connected with the reel, a two-armed lever one arm of which is rocked by the pulldown by way of a torsion spring and the other arm of which carries two pawls. One pawl is disengaged from one of the gears when the other pawl rotates the other gear, and vice versa, whereby the reel rotates in a single direction.

27,840
TANDEM ROLLER

Donald D. Kronholm, Portland, Oreg., assignor to Hyster Company, Portland, Oreg.

Original No. 3,416,419, dated Dec. 17, 1968, Ser. No. 658,672, Aug. 7, 1967. Application for reissue Apr. 8, 1971, Ser. No. 132,622
Int. Cl. E01c *19/26*
U.S. Cl. 404—122 24 Claims



This application discloses a tandem roller especially suited for compacting road surfacing materials such as asphalt. The roller includes a front steerable roll and a rear driven roll which together support a frame composed of a platform between the rolls, longitudinal side frame members on opposite sides of the traction roll and a gooseneck extending forwardly from the platform over the front roll for connection to a steering yoke. A driver's compartment on the platform has a pair of operator seats facing inwardly toward one another on opposite sides of and below the upper level of the gooseneck, which is extremely narrow so that the operator has a clear view of the steering roll. A single steering wheel is positioned on

one side of and between the seats, and a directional control bar is positioned on the opposite of and between the seats so that the operator can control the roller from either seat and in either direction with equal facility. The engine compartment is positioned behind the seats toward the traction roll, and a water supply tank for a sprinkler system is positioned beneath the seats. Neither of the two rolls is shrouded and the longitudinal side frame members are of a narrow, thin design which permit an unobstructed view of the traction roll from the operator's seats.

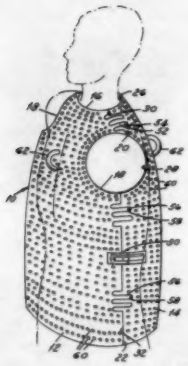
The traction roll is driven hydrostatically. An internal combustion engine drives a pressure compensated hydraulic pump on the platform which delivers pressure fluid to a hydraulic motor within one end of the traction roll. Rotary power is transmitted from the hydraulic motor through a drive shaft extending through the center of the traction roll to a planetary gear reduction final drive unit mounted within the opposite end of the roll. As a consequence, none of the drive components project outwardly of the smooth frame contour to obscure visibility from the operator's seat to the traction roll. The planetary final drive is totally sealed and runs in oil for reduced maintenance. Special mounts secure the traction roll to the side frame members and permit easy removal of the roll from the frame without disturbing the planetary drive unit and permit ready access to the hydraulic motor through an access opening in the associated side frame member.

PATENTS

GRANTED DECEMBER 11, 1973

GENERAL AND MECHANICAL

3,777,309
SAFETY GARMENT STRUCTURE
Weldon O. Yeager, 222 Hamilton Rd., Oakland, Mich.
Filed Mar. 15, 1972, Ser. No. 234,921
Int. Cl. F41h *1/02*
U.S. Cl. 2—2.5 **5 Claims**



The safety garment structure is designed for use in the construction industry and is adapted to be supported by the shoulders of the body of the wearer. It includes a pair of front and back panels molded or otherwise formed from suitable light weight material, with the panels being hingedly connected at a pair of opposing side edges. The panels when closed on the body surround and protect the chest and the upper part of the body with adequate clearance between the panels and the body to permit lung and abdominal expansion. The panels are provided with opposing arcuate edges to define the neck opening and arm holes and have a configuration generally following the contour of the body. Releasable fastening means interconnect the other pair of opposing side edges of the panels to permit the panels to be fastened together on the body. At least one of the panels is provided on the outer surface with a staple-like half-loop or grasp. In the event of an accident, as an example, if a tunnel or trench should collapse, it may be possible to remove the workman by a suitable lifting device which would engage the grasp provided on the safety garment structure and lift the workman to safety.

3,777,310
DECORATIVE APPLIQUE HAVING AIR-ACTUATED NOISEMAKER
John F. Y. Yang, 802 Mason House, 74 Nathan Rd., Kowloon, Hong Kong
Filed Oct. 16, 1972, Ser. No. 297,888
Int. Cl. A41d *13/10*
U.S. Cl. 2—48 **10 Claims**

A decorative applique comprises a backing member and a flexible covering member superposed on and sealed to the backing member to define therebetween a pair of flexibly contractible air chambers. An air-activated noisemaker including a vibratory reed is mounted between the pair of air chambers and manual contraction of one chamber forces the air from that chamber through the noisemaker into the other chamber thereby vibrationally driving the reed to produce an audible noise. The covering member may be sealed to a preformed backing member to define an applique unit which may be attached to any desired article or the covering member may be sealed directly to the desired article which then serves as the backing member.

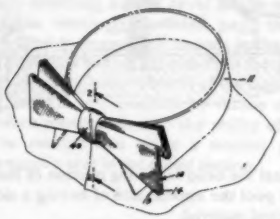
3,777,311
METHOD OF MANUFACTURING GARMENT COLLARS
Antonio C. Freixas, Sanjuanistas St., 24, Barcelona, Spain
Continuation-in-part of Ser. No. 849,201, Aug. 11, 1969, abandoned. This application Mar. 27, 1972, Ser. No. 238,575
Claims priority, application Spain, Aug. 12, 1968, 357197
Int. Cl. A41b *3/08*
U.S. Cl. 2—143 **6 Claims**

A method of manufacturing garment collars comprises molding a flexible collar stiffener having the configuration of the desired garment collar, flattening the collar stiffener into a planar configuration and sewing a fabric covering on the flattened collar stiffener while the fabric covering is maintained in a tensioned condition, and then allowing the flattened collar stiffener to return to its original configuration thereby defining a garment collar.

3,777,312
PRE-FORMED CLIP BOW TIES
John Najarian, Cresskill, N.J., assignor to France Neckwear Co. Inc., New York, N.Y.
Continuation-in-part of Ser. No. 320,976, Jan. 4, 1973. This application June 14, 1973, Ser. No. 370,151
Int. Cl. A41d *25/08*
U.S. Cl. 2—154 **3 Claims**

A pre-formed bow tie comprises the usual bow shaped elements which are interconnected at their constricted, reduced width, centers, by a locking band wrapped therearound. The band is covered by fabric. The band also includes a spring controlled vertically swingable lever arm by means of which the pre-formed bow ties may be releasably secured to the neckband of a shirt without being connected to the collar of

the shirt. The neckband may be that of a turtle neck shirt as well as the conventional collared shirt. The locking band is improved by insuring that when it is wrapped around the bow centers, it will bend in a predetermined fashion in order to

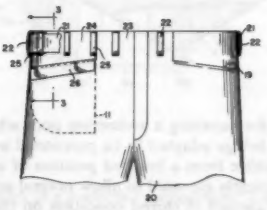


avoid random bending and consequent often less desirable finished products. This is accomplished by providing side guards or ridges along selected portions of the locking band to insure desired bending thereof in the production of the bow ties.

3,777,313
SPORTS POCKET FOR WEARING APPAREL

Mary E. Bergsten, and Ralph A. Bergsten, both of P.O. Box 607, Green Valley, Ariz.

Filed Sept. 1, 1972, Ser. No. 285,760
Int. Cl. A41d *27/20*
U.S. Cl. 2—247 **5 Claims**



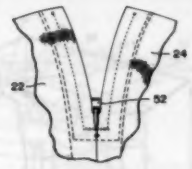
A sports pocket to fit inside an existing pocket of trousers, or skirts, adapted to be held in place at the waistband by the usual belt extending through belt loops on the sports pocket, or having an upper portion folded over the waistband and secured by a self-adhering fastener, or a zipper, or snap-fasteners and in either form having a turned over flap which overlies the outside upper edge of the trouser pocket and helps to retain the sports pocket in place. The exposed turned over flap portion and the exposed portion adjacent the entrance to the sports pocket, as well as that portion containing the belt loops, and the loops, are made of the same material and color as the trousers, or slacks, or these portions can be made from materials of contrasting color, or different fabrics such as to impart a casual or sports look to the trousers.

3,777,314
GARMENT OR LIKE ARTICLE HAVING A SLIDE FASTENER ATTACHED THERETO

Ronald J. Boser, Huntington Station, N.Y., assignor to B. & W. Manufacturing Co. Inc., New York, N.Y.

Filed Feb. 2, 1972, Ser. No. 222,863
Int. Cl. D05b *3/12*
U.S. Cl. 2—265 **7 Claims**

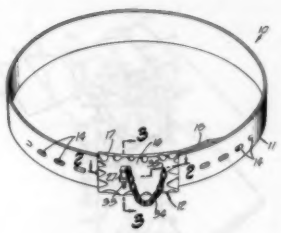
A slide fastener from a continuous chain is attached to a garment or other article by a pair of stitching threads each running longitudinally along a respective one of the fastener tapes, at least one of the stitching threads continuing transversely across the slide fastener to form a bottom stop and to attach the fastener tapes together and to the article for reinforcement.



3,777,315
BELT AND BUCKLE ASSEMBLY

David E. Norfolk, 6170 Canterbury Dr.; Apt. 5-118, Culver City, Calif.

Filed May 18, 1972, Ser. No. 254,397
Int. Cl. A41f *9/02*
U.S. Cl. 2—321 **15 Claims**



A belt adapted to be worn about the torso and equipped with clasp means detachably securable to either end thereof. The channel shaped clasp plate embraces the forward face of the overlapped belt ends and conceals separate means for securing each belt end to the clasp plate. One of the securing means comprises a pair of headed pins mounted on the rear of the clasp plate and seatable in keyholes punched in one belt end. The other securing means comprises a T-shaped lug having a friction fit in a selected opening through the other end of the belt, its T-stem being insertable through the clasp plate from its rear and being held in place by a keeper pin held captive to the plate by a chain or other flexible tie.

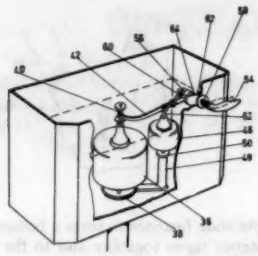
3,777,316
WATER CISTERNS

Rudolph Gerhardus Coetzee, 17 Marie St., Preagville, Randburg, Transvaal, Republic of South Africa

Filed July 8, 1971, Ser. No. 160,814
Claims priority, application Republic of South Africa, Aug. 12, 1970, 70/5578; Sept. 30, 1970, 70/6665
Int. Cl. E03d *1/22, 1/30*
U.S. Cl. 4—34 **14 Claims**

The invention relates to cisterns in which partial and full flushes may be obtained with simple operations of the cistern

handle. The handle is normally only able to pivot through a small angle to provide a partial flush but on moving the handle

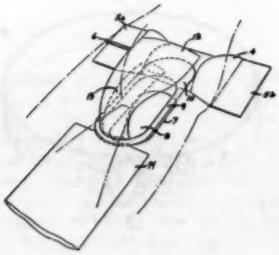


in the direction of the handle shaft axis, the handle may pivot through a larger angle to initiate the full flush.

3,777,317
DEVICE FOR DEFAECATION AND URINATION IN THROW-AWAY BED-PANS

Jan Ingvar Hoborn, 77 Gamla Sarovagen, Askim, Sweden

Filed May 1, 1972, Ser. No. 249,178
Int. Cl. A61g *9/00*
U.S. Cl. 4—112 **5 Claims**



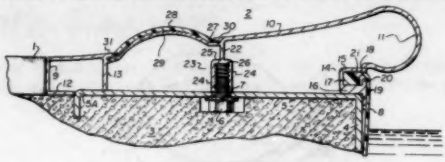
Today bed-pans used in hospitals and the like have to be cleaned and disinfected after every use and furthermore the use of the same involves lifting of the patients. This invention relates to a throw-away bed-pan made of destructable material and combined with a lifting device adapted to facilitate the handling of the patient. The bed-pan also has means preventing the soiling of the bed and means for containing the used bed-pan.

3,777,318
SWIMMING POOL COPING

Albert H. Stillman, Jr., 38 Southern Blvd., Nesconset, N.Y.

Division of Ser. No. 184,295, Sept. 27, 1971, which is a continuation of Ser. No. 793,862, Jan. 24, 1969, abandoned. This application Dec. 6, 1972, Ser. No. 312,695
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.21 **19 Claims**

A coping for a swimming pool comprising a body member having a top wall portion including means for removably receiving an insert whereby the coping, by selective choice of color, chemical composition, texture and/or character of the insert material, may be enhanced in appearance and made highly functional. The coping further includes means for removably receiving a member of selected material, e.g., tile

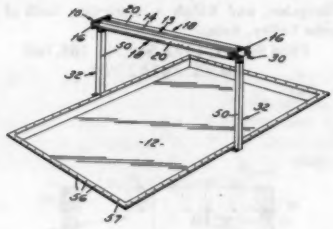


so as to conceal the bead receiving portion of the pool and so as to give the pool the appearance of having a side wall made from the selected material.

3,777,319
SWIMMING POOL COVER

J. Edgar Myles, Fraser, Mich., assignor to J. E. Myles, Inc., Detroit, Mich.

Filed Mar. 23, 1972, Ser. No. 237,481
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.14 **14 Claims**

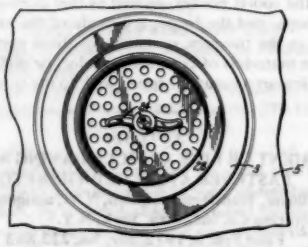


Apparatus for covering a swimming pool when not in use comprising a bridge adapted to be positioned adjacent to the pool and movable from a lowered position of use to a raised position sufficiently elevated to allow normal use of the pool. The cover is carried in stored condition on the bridge. The cover is extendible to cover the pool in the lowered position of the bridge.

3,777,320
DRAIN CONTROL MEANS

William E. Politz, Delphi, Ind., assignor to Stephen A. Young, Monticello, Ind.

Filed June 16, 1972, Ser. No. 263,546
Int. Cl. A47k *1/14*; **E03c** *1/26*
U.S. Cl. 4—287 **3 Claims**



The disclosure hereof is of a drain control means, primarily for use in sinks or similar environment where the problems in

sinks are comparable, and consists of a drain body of relatively large diameter, having a suitable flange for support of a sink opening, a reduced drain outlet section with control unit or member having a downwardly open threaded section adapted to be guided on to a spud by reason of the configuration of the respective parts involving a wide bevel at the mouth of the downwardly open interiorly threaded part, threads being formed on the spud to engage the threads in the part and by reason of the configuration of the mouth of the part directed to engagement virtually independently of the manner in which the parts are brought into position by reason of the flared mouth heretofore mentioned, with the ability of the control member to be rotated and cause a stopper part formed therewith to engage a seat in the outlet section.

3,777,321

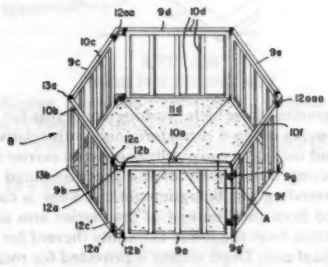
PORTABLE COLLAPSIBLE PLAYPEN

Lawrence W. Hargett, 17 Oak Ave., Tenafly, N.J.

Filed Feb. 22, 1972, Ser. No. 227,840

Int. Cl. A47c *29/00*

U.S. Cl. 5—99 C **9 Claims**



A playpen which in a preferred embodiment is inclusive of a bottom cushion as a part of each of upwardly foldable floor segments pivotable from adjacent fence elements attached in series to other consecutive similar sections with the last section being joinable with the first section of the series and with the upwardly foldable floor segments when downwardly mounted being joinable with adjacent other floor sections preventable of upward movement of any one or more of the floor sections when in a closed-fence state, the playpen being collapsibly foldable in an accordion-like fashion resulting from intermediate hinge elements between alternate ones of the several sections of the series.

3,777,322

SPRING BASE AND METHOD OF FORMING SAME

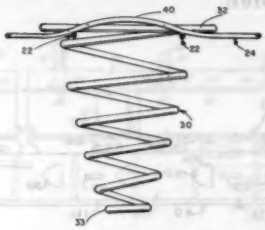
Sam Larkin, Belle Harbor, N.Y., assignor to Spring Associates, Inc., Brooklyn, N.Y.

Filed Jan. 3, 1972, Ser. No. 214,773

Int. Cl. A47c *23/02*

U.S. Cl. 5—267 **6 Claims**

A spring base and method of forming same, the spring base comprising an intersecting grid-like array of transversely and longitudinally extending metallic rods, welded to one another at mutually intersecting portions, and a plurality of springs connected to the grid-like array. Each of the springs is provided with a closed, generally circular end portion, which is wedged and restrained against lateral displacement by a pair of longitudinally extending metallic rods biasing thereagainst



in one direction and an associated pair of transversely extending metallic rods biasing thereagainst in a generally opposite direction.

3,777,323

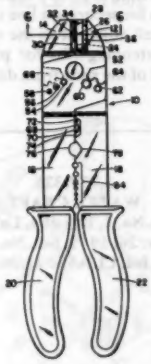
HAND TOOL FOR CRIMPING, CUTTING AND STRIPPING

Maxwell Ingram, 15 Hamilton Ave., Dumont, N.J.

Filed Aug. 24, 1971, Ser. No. 174,437

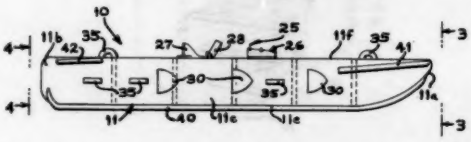
Int. Cl. H02g *1/12*; B25b *7/22*; B21d *9/08*

U.S. Cl. 7—5.4 **6 Claims**



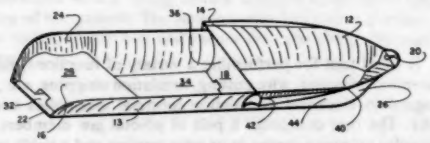
A hand tool for performing a variety of functions, such as terminal crimping, wire cutting, insulation stripping, etc., with regard to electrical connection terminal assemblies and the like. The tool comprises a pair of pivotal jaw members with circular crimping means in its nose portion and a guide means adjacent the ferrule crimping means. The tool also is provided with bolt and screw cutting means, including screw threaded work-holding apparatus and arcuate shears adapted to cut through the bolts or screws while they are held in the threaded holes. In addition, the tool is provided with a cam-like terminal lug crimping means for ignition cable and with a wire cut-off means whereby the cut-off blade has angular ends to provide space for squeezed out insulation that prevents cutting of conductor and insulation. The tool also has wire stripping apertures, and these, similarly to the bolt and screw work-holding apertures, are arranged so that the larger apertures are closer to the pivot point of the tool, whereby a greater mechanical advantage is utilized for the heavier work pieces.

3,777,324
ALL PURPOSE SHOE
Larry E. Jenkins, 481 Loumena Ln., San Jose, Calif.
Filed Sept. 1, 1971, Ser. No. 176,951
Int. Cl. A63c 15/02
U.S. Cl. 9—310 D 11 Claims



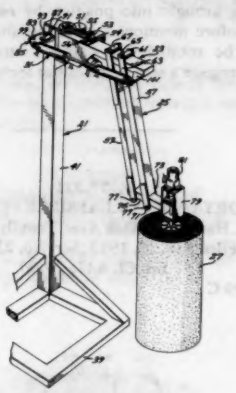
A shoe for movement over water, snow, sand, mud and the like. There is a shoe for each foot of the wearer. Each shoe comprises a hollow, elongated body made of suitable material, such as an injection molded polypropylene plastic. The forward end of each shoe is curved inwardly from side-to-side and top to bottom, and also is centrally contoured at the forward end to form a lifting surface. The rear end of the shoe is slightly curved from side-to-side and from top to bottom. Midway between the ends of each shoe, and mounted on the upper wall thereof, is a toe pocket, a heel strap and ankle straps for securing a foot to the associated shoe. Along the side walls are found horizontally spaced friction cups to provide traction for a foot remaining in position while the other foot is advanced. A plurality of closed curved members are secured to the side and top walls of each shoe to form a hand grip and also to form an anchor or tie-loop for securing a line or the like to the shoe. Along the bottom wall adjacent to the side walls of the shoe are longitudinally extending ribs for protecting the bottom wall and forward end of the shoe from damage.

3,777,325
WATER CRAFT
William J. Bristol, Rt. No. 1, Box 404, Lake Placid, Fla.
Filed Dec. 26, 1972, Ser. No. 318,458
Int. Cl. A63c 15/00
U.S. Cl. 9—310 B 2 Claims



A ski-type craft having an elongated streamlined hull body with a bow and a substantially flat stern, a pair of sponsons extending from the bow where the sponsons tend to blend in with the bow, backwards to about the middle of the craft where the sponsons extend outwards like wings, a rear seat having a water exhaust port extending therethrough at the rear of the hull, a foot rest and brace of triangular cross section extending across the center of the hull also having a water exhaust port extending therethrough, and a key hole which at the bow of the craft with a rope and knot retaining slot therein.

3,777,326
VEHICLE WASHING APPARATUS
David M. Haley, Glendale, and Richard P. Bergantzel, Granada Hills, both of Calif., assignors to California Car Wash Systems, Inc., Sun Valley, Calif.
Filed Dec. 10, 1971, Ser. No. 206,804
Int. Cl. B60s 3/06
U.S. Cl. 15—21 D 13 Claims

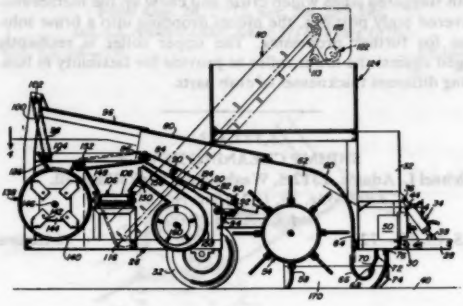


Parallelogrammatic vehicle washing apparatus for washing a vehicle moving along a predetermined path relative to the apparatus and including a pivotally supported carrier arm normally projecting transversely of the predetermined path. A vertically extending parallelogrammatic linkage is carried on its upper end from the free end of the carrier arm and has a brush supported from the lower extremity thereof for rotation about a vertical axis. Drive means is provided for rotating the brush and controlling movement of the carrier arm and parallelogrammatic linkage for normally maintaining the linkage extended with the brush disposed in the vehicle path and responsive to engagement thereof by the front of the vehicle to be washed to retract the parallelogrammatic linkage while the free end of the carrier arm moves forwardly to draw the brush across the front of the forwardly moving car and to then swing the free end of the carrier arm rearwardly, while extending the linkage, to move the brush rearwardly along the side of the vehicle and responsive to the brush clearing the rear corner of the vehicle to move the free end of the carrier arm forwardly to move the brush inwardly along the rear of the car and forwardly therewith.

3,777,327
LITTER PICK-UP MACHINE
Sloan E. Ellis, San Saba, Tex., assignor to San Saba Development Association, San Saba, Tex., a part interest
Continuation-in-part of Ser. No. 214,702, Jan. 3, 1972. This application Mar. 9, 1972, Ser. No. 233,146
Int. Cl. E01h 1/04
U.S. Cl. 15—84 11 Claims

A mobile apparatus for movement over the ground or other surface and designed to pick-up, partially sort and partially treat litter of all types. The apparatus includes windrow structure for initially windrowing litter to be picked up and a following horizontal reversely rotating pick-up drum including generally radial flexible flaps for picking the windrowed litter up from the ground or other surface over which the apparatus is moving. Thereafter the retrieved litter is conveyed upwardly by a conveyor (from which small stones and dirt are allowed to fall) and allowed to drop through a flow stream of air resulting in the lighter particles of litter, including grass and weed clippings, being separated from the larger heavier particles of

litter. Structure is provided for collecting the separated lighter particles of litter and delivering them to a hammer mill and conveying structure is provided for receiving and upwardly conveying the heavier litter material to an elevated storage bin or hopper carried by the apparatus and supported therefrom



for movement between a heavier litter receiving position and a dumping position disposed so as to dump the collected heavier litter to one side of the apparatus into a suitable receptacle such as a vehicle supported hopper moving alongside the litter pick-up apparatus.

3,777,328

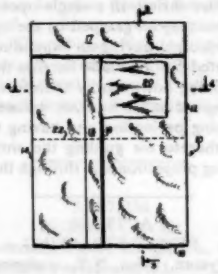
SHOE POLISHING MIT

Milton Kaplan, Rockville Center, N.Y., assignor to Sentinel Bag and Paper Co., Inc., Brooklyn, N.Y.

Filed Mar. 22, 1972, Ser. No. 236,945

Int. Cl. A47l *13/314*

U.S. Cl. 15—104.94 **7 Claims**



A shoe polishing mit formed of a bag member dimensioned to encompass a human hand. The bag member is formed of a relatively inexpensive non-abrasive felted material, and a portion of one side of the bag is impregnated with a polishing or protective substance such as wax subject to deposition on the surface to be polished by physical contact of the impregnated area with the surface to be polished. A wax distributing flap and seam are provided to implement distribution of the wax.

3,777,329

OPEN-END TEXTILE SPINNING MACHINES

Robert Lane, Accrington, England, assignor to Platt International Limited, Oldham, Lancashire, England

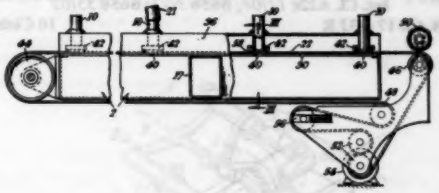
Filed Nov. 30, 1971, Ser. No. 203,163

Claims priority, application Great Britain, Dec. 1, 1970, 57,042/70

Int. Cl. A47l *5/38*

U.S. Cl. 15—301 **8 Claims**

A textile machine for the open-end spinning of textile yarns including a plurality of spinning stations each of which is provided with a trash collection chamber for collecting trash from fibre fed to a spinning element at the station, and trash removal apparatus comprising an air exhaust chamber common to the trash collection chambers for removing trash from the chambers. Each trash collection chamber having an outlet



leading from the interior thereof and the air exhaust chamber having an inlet leading to its interior. Said machine including means for intermittently connecting each outlet and the inlet so as to provide an intermittent flow connection between each trash collection chamber and the air exhaust chamber whereby to purge the trash collection chambers of trash.

3,777,330

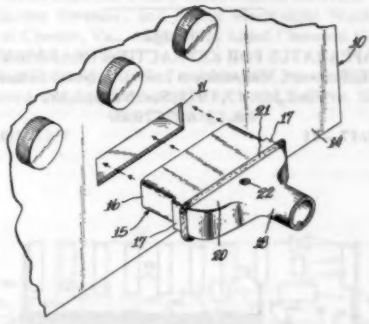
MAINTENANCE MEANS FOR TAPE PLAYER CABINETS

Isadore E. Van Huffel, 400 Overlook Dr., N.E., Warren, Ohio

Filed Sept. 8, 1972, Ser. No. 287,536

Int. Cl. A47l *9/02*

U.S. Cl. 15—421 **6 Claims**



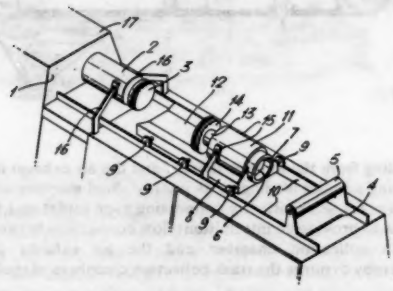
My invention relates to means for maintaining the interior of a tape player cabinet free of dust and other like deleterious material, and comprises a hollow suction nozzle having a forward end with an outside rectangular contour to closely conform to, and fit within, the rectangular opening in the tape player cabinet. The nozzle has an exterior shoulder for abutment with the exterior face of the cabinet margining the rectangular opening to limit insertion of the nozzle forward end an amount short of interference with the operating mechanism within the cabinet. A rubber ring stretched around the nozzle may be moved to seal the rectangular opening. A small transverse hole is formed in the nozzle and is used to control the amount of suction produced within the nozzle by a conventional suction cleaner.

3,777,331

APPARATUS TO BE USED IN CONNECTION WITH THE FILLING OF TUBULAR FILMS, SO CALLED SYNTHETIC CASINGS

Helge Jorgen Falborg, Aabybro, Denmark, assignor to Maskinfabriken Hefa, Aabybro A/S, Aabybro, Denmark

Filed Mar. 26, 1971, Ser. No. 128,288
Claims priority, application Denmark, Mar. 31, 1970, 1614
Int. Cl. A22c *11/04*; B65b *3/12*; B65d *55/02*
U.S. Cl. 17—32 R 10 Claims



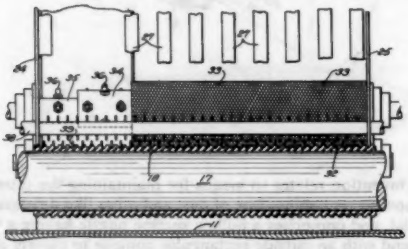
A continuous length of tubular synthetic casing is filled with successive charges of sausage meat or other food product by transporting the free end of the casing by means of a conveyor onto a filling tube from which the food charges are extruded, clamping the casing end on the filling tube, retracting the conveyor to its starting position, extruding the charge of food into the casing, and tying off and cutting the ends of the filled casing. The food charge is inserted into the casing with flat end pieces at each end thereof, and the casing is tied or clamped to the end pieces providing the finished product with ends of uniform diameter for slicing.

3,777,332

APPARATUS FOR EXTRACTING CRAB MEAT

Albert E. Boisvert, Maswansicut Lake Dr., North Scituate, R.I.

Filed Jan. 17, 1972, Ser. No. 218,182
Int. Cl. A22c *29/00*
U.S. Cl. 17—71 9 Claims



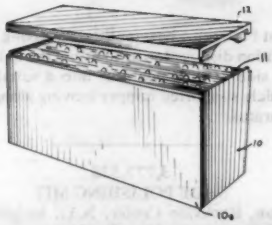
Apparatus for squeezing meat from the claws and flippers of cooked hard shell crabs and for preparing the body for further processing. A supporting frame is provided with a conveyor belt. Dividing strips on the frame, above the belt, divide the surface into a plurality of narrow longitudinal lanes and a single comparatively wide lane along one side edge. Claws and flippers are conveyed along the narrow lanes which keep them in a generally longitudinal attitude. The body of the crab, minus the shell, is conveyed in the wider lane at one side. At the end of the belt, a plurality of rotating guide fingers pass the parts from the conveyor to a pair of rollers which squeeze the meat from the claws and flippers, the meat dropping into a suitable receptacle. The rollers are provided with narrow diameter portions at one end in alignment with the wider lane for receiving the body. At this point the rollers are provided with staggered studs which crush and chew up the membrane-covered body portions, the pieces dropping into a brine solution for further processing. The upper roller is resiliently urged against the lower roller to provide for flexibility in handling different thicknesses of crab parts.

3,777,333

SHRIMP CLEANING DEVICE

Michael L. Adams, 1312 S. Washington, Park Ridge, Ill.

Filed Mar. 29, 1972, Ser. No. 239,157
Int. Cl. A22c *29/00*
U.S. Cl. 17—72 6 Claims



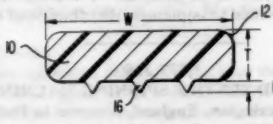
A shrimp cleaning device that deveins, separates the shell from and butterflies shrimp in a single operation including a handle portion that may be grasped by the operator, an arcuate deveining projection having an expanding width for shell separation, a slanted cutting blade fixed to the deveining projection and extending downwardly therefrom for cutting the shrimp meat longitudinally, and an arcuate guide portion below the deveining projection and having the other end of the blade fixed thereto for guiding the shrimp as it passes down the deveining projection and through the cutting blade.

3,777,334

RIBBED STRAPPING

Albert J. Countryman, Utica, N.Y., assignor to Ty-Lok Assembly Systems, Inc., Utica, N.Y.

Filed Sept. 29, 1972, Ser. No. 293,736
Int. Cl. B65d *63/00*
U.S. Cl. 24—16 PB 3 Claims



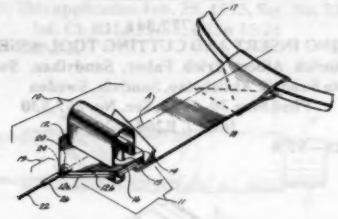
Plastic strapping generally rectangular in section of the type used to tie bundles of electrical conductors as in my patented strapping apparatus, U.S. Pat. No. 3,633,633 granted Jan. 11, 1972, is extruded with a plurality of parallel, pointed longitudinal ribs, short in height, which prevent the tape from slipping during reverse feed by the gun.

3,777,335

STRAP AND CABLE COUPLING AND INTERCONNECTING SYSTEM EMPLOYING SUCH COUPLING

Wesley C. Prout, St. Anne, Ill., assignor to Park, Davis & Company, Detroit, Mich.

Filed Aug. 24, 1972, Ser. No. 283,584
Int. Cl. A44b *21/00*; A44c *5/18*; F16g *11/02*
U.S. Cl. 24—79 5 Claims



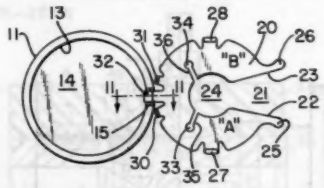
A strap and cable coupling. A buckle part is formed of a planar member with at least three substantially parallel elongated openings spaced apart and extending through the planar member for receiving such strap. The center of elongation of each of the openings is positioned along an axis. A cable connecting part includes a semi-circular receptacle integrally formed on the member at an edge thereof and at a position substantially intersecting the axis. The receptacle has an exterior extending opening. The cable connecting part also includes a ball portion rotatably mounted in the receptacle and is adapted to be connected to the cable. The receptacle forms an interference so as to retain the ball therein. Preferably, the coupling is part of an interconnecting system and includes a strap and a cable. The cable is affixed to the ball and the strap passes serially through all three openings, beginning at a first opening which is furthest removed from the member edge and then loops back through the first opening.

3,777,336

BUTTON COVER

Olof Verner Anderson, North Kingstown, R.I., assignor to Anson Incorporated, Providence, R.I.

Filed Sept. 14, 1972, Ser. No. 289,159
Int. Cl. A44b *1/14*
U.S. Cl. 24—113 MP 4 Claims



The present disclosure relates to the jewelry art and specifically to an improved interchangable ornamental cover for sewed buttons.

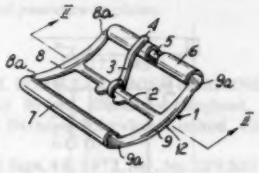
The present invention relates to a novel construction for an ornamental and removal cover for sewed buttons.

3,777,337

BUCKLE FOR SHOES AND THE LIKE

Adalberto Sussman Steinberg, via Mancini 5, Milan, Italy

Continuation-in-part of Ser. No. 50,663, June 29, 1970, abandoned. This application Feb. 14, 1972, Ser. No. 226,085
Claims priority, application Italy, July 2, 1969, 19089A
Int. Cl. A44b *11/12*
U.S. Cl. 24—191 1 Claim



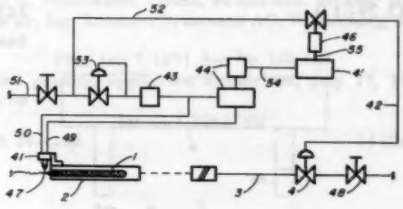
A shoe buckle comprising a quandrangular frame having two parallel side bars and two end bars connecting the ends of the side bars and extending transverse thereto and a cross-bar intermediate the end bars and fixed on the side bar, a tongue hingedly supported on the cross-bar and cooperating with one of the end bars and extending parallel to the side bars. The side-, end- and cross-bars are made of strip-like sheet metal material and the side bars have a cross section having an outer margin lying all along its extension at a level higher than that defined by the bottom of the frame of the buckle.

3,777,338

ELECTRONIC-PNEUMATIC YARN PLUG CONTROL SYSTEM FOR YARN TEXTURING DEVICE

Dick Charles Vermeer, and James MacKnight Washington, both of Chester, Va., assignors to Allied Chemical Corporation, Morristown, N.J.

Continuation-in-part of Ser. No. 239,176, March 29, 1972, abandoned. This application Sept. 18, 1972, Ser. No. 289,926
Int. Cl. D02g *1/12*
U.S. Cl. 28—1.7 14 Claims

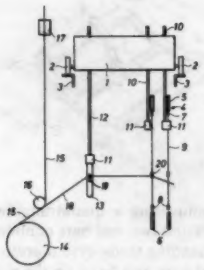


Apparatus and process are disclosed for controlling yarn plug location in a stuffer tube of a steam jet texturing device near at least one port near the discharge end of the stuffer tube. The port issues a jet of fluid, such as air. Back pressure of the jet of fluid as it impinges on the yarn indicates the presence or absence of the yarn plug beneath the port. Each port communicates with a pressure sensor controller which actuates a control valve which controls the flow of steam to the steam jet.

3,777,339
APPARATUS FOR INDIVIDUALLY SEPARATING HEDDLES AND LIKE OBJECTS FROM A ROW PREPARATORY TO A DRAWING-IN OPERATION

Svend Sigurd Christie Fleischer, Klampenborg, and Knud Helge Jeppsson, Copenhagen, both of Denmark, assignors to Titan Textile Machines A/S, Metalbuen, Ballerup, Denmark

Filed June 16, 1972, Ser. No. 263,573
Claims priority, application Denmark, June 17, 1971, 2982
Int. Cl. D03j *1/14*
U.S. Cl. 28—46 10 Claims

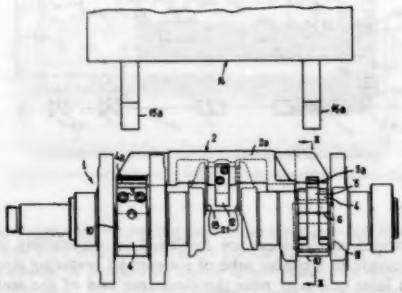


Apparatus for individually and successively separating heddles from a row of heddles by means of an electromagnet which is moved towards the first heddle in a row to remove that heddle to a position in which a thread may be pulled through the heddle eyelet. During the first part of the movement of the magnet away from the heddle row, the magnet receives a relatively weak current ensuring that only one heddle is taken along, and when the heddle has been sufficiently detached from the remaining heddles in the row, the current is increased to increase the holding force of the magnet. Two or more heddles may be separated from different rows in one operation, preferably with a short time interval so that they will be moved to spaced drawing-in positions. The apparatus may also be used for separating drop blades and similar object preparatory to a drawing-in operation.

3,777,340
DEVICE FOR PRE-BALANCING UNBALANCED MASSES ON CRANKSHAFTS

Christian Langlois, Billancourt, France, assignor to Regie Nationale Des Usines, Renault, Billancourt, France

Filed June 15, 1971, Ser. No. 153,285
Int. Cl. B23p *13/00*
U.S. Cl. 29—1 D 3 Claims

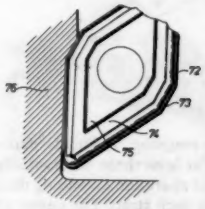


A device for quick attachment to a crankshaft for balancing it. It comtemplates pre-balancing the unbalance masses of crankshafts of piston engines in order to subsequently perform the dynamic balancing thereof with due consideration for the wants-of-balance generated by the connecting-rod masses. These wants-of-balance are simulated by positioning on the crankshaft a single pre-balancing member having two ballasts disposed in parallel planes perpendicular to the axis of rotation of the crankshaft. This simulation member also has two resilient clamping members adapted to engage two crankpins of the crankshaft to be balanced, an angular positioning fork engaging a third crankpin, and longitudinal positioning faces between the webs of one of said crankpins.

3,777,341
CUTTING INSERT AND CUTTING TOOL ASSEMBLY

Kurt Heinrich Albert Erich Faber, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandvik, Sweden

Filed May 30, 1972, Ser. No. 257,530
Int. Cl. B26d *1/00*
U.S. Cl. 29—95 R 7 Claims

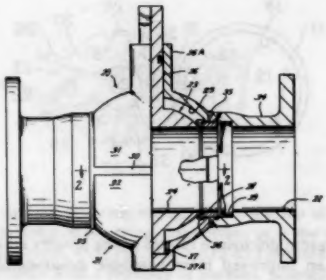


The cutting tool assembly of the present invention consists essentially in (*a*) a tool holder and (*b*) an indexible cutting insert of modified rhombic configuration in which pairs of main cutting edges (disposed at an angle of less than 60° with respect to each) are separated by intermediate facing edge portions which are parallel to each other. The intermediate facing edge portions are so configured as to constitute outfacing cutting edges each of which cooperates with the main cutting edge adjacent thereto. Both the pairs of main cutting edges and the out-facing cutting edges are provided with chip-breaking grooves. The assembly provides an arrangement wherein not only the main cutting edge but also the out-facing cutting edge of the cutting insert are laid bare with respect to the tool holder.

3,777,342
METHOD OF ASSEMBLING VALVE

Herbert Allen, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Division of Ser. No. 184,727, Sept. 29, 1971, Pat. No. 3,732,885. This application Jan. 24, 1973, Ser. No. 326,542
Int. Cl. B21d *53/00*
U.S. Cl. 29—157.1 22 Claims



A valve having seats made of axially separable, inner and outer parts which may be moved to positions, during assembly

of the valve, permitting adjacent parts of the valve body to be welded and the weldments to be stress relieved without damage to seal rings carried by the seats.

3,777,343

METHOD FOR FORMING A HELICALLY CORRUGATED CONCENTRIC TUBING UNIT

Mario L. D'Onofrio, Hartford, Conn., assignor to Spiral Tubing Corporation, New Britain, Conn.

Division of Ser. No. 123,150, March 11, 1971, Pat. No. 3,730,229. This application Feb. 28, 1973, Ser. No. 336,794

Int. Cl. B21d *53/02*; B23p *15/26*

U.S. Cl. 29—157.3 R 4 Claims

A tubing unit useful, for example, as part of a heat exchanger includes a first tube containing a second helically corrugated tube having on its outer surface helical ridges which engage the inner wall of the first tube to mechanically lock the two tubes in assembly and to form one or more helical passageways between the first and second tubes. The first tube may be of a substantially straight cylindrical shape or may include helical grooves on its inner surface for receiving and mating with the radial outer end portions of the helical ridges on the outer surface of the second tube. A third tube may surround the first tube and include helical corrugations with inwardly extending ridges engaging the outer surface of the first tube to form another set of helical passageways between the first tube and the third tube. In the making of the tubing unit, the second tube is assembled over a mandrel and within the first tube and then twisted to form the helical corrugations therein, the mandrel limiting the inward growth of the inwardly extending ridges and the first tube limiting the outward growth of the outwardly extending ridges. In cases where a third tube is used, such third tube is placed over the second tube and twisted to form helical corrugations therein, the outer surface of the first tube limiting the radial inward growth of the inwardly extending ridges thereof.

3,777,344

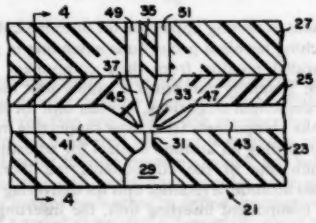
METHOD OF FABRICATING FLUIDIC ELEMENTS BY ASSEMBLING TOGETHER A PLURALITY OF PLASTIC STRIPS

John P. Glass, c/o Cava Industries 79 La Grange Ave., Essington, Pa.

Division of Ser. No. 828,643, May 28, 1969, Pat. No. 3,589,382, division of Ser. No. 88,582, Nov. 12, 1970. This application June 30, 1972, Ser. No. 267,965

Int. Cl. B23p *17/00*

U.S. Cl. 29—157 R 9 Claims



A fluidic plate assembly comprising a series of abutting plates including a power nozzle plate having an input chamber which narrows down into a power nozzle, a control passageway plate having an interaction chamber with an opening that registers with the power nozzle and having a plurality of control passageways with nozzles that open into the interaction chamber, a splitter plate having a splitter which extends into the interaction chamber to form an output ring and having a plurality of output passageways that register with the output ring, and means connecting adjacent plates together and forming a tight seal. Apparatus for making fluidic plates comprising standard mold units for making a series of plates in various combinations including power nozzle plates, splitter plates, and control passageway plates.

3,777,345

TOOL FOR GEAR FINISH FORMING

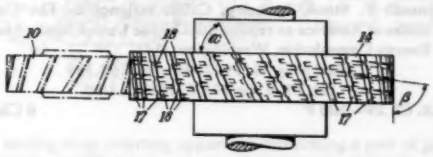
Graham Maurice Brown, Daventry, England, assignor to Machine Tool Divisional Services Limited, Coventry, England

Filed Sept. 18, 1972, Ser. No. 289,831

Claims priority, application Great Britain, Sept. 17, 1971, 43472/71

Int. Cl. B21h *5/00*

U.S. Cl. 72—102 2 Claims



A toothed tool for finish forming, by rolling, a cylindrical or helical work gear, said tool having, in the flanks of its teeth, serrations extending perpendicular to the axis of the tool which define flutes in the tooth flanks and intervening lands, the flutes on each tooth flank extending alternately from the tip towards the root and from the root towards the tip and extending along part only of the length of the tooth flank and being so disposed that corresponding flutes on successive tooth flanks are disposed helically on the circumference of the tool.

3,777,346

TENSION BAND

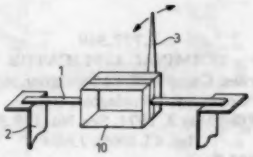
Samuel G. Steinemann, Liestal, Switzerland, assignor to Institut Dr. Ing. Reinhard Straumann AG, Waldenburg, Switzerland

Filed July 7, 1971, Ser. No. 160,465

Claims priority, application Switzerland, July 17, 1970, 10878/70

Int. Cl. C22c *27/00*

U.S. Cl. 29—180 11 Claims

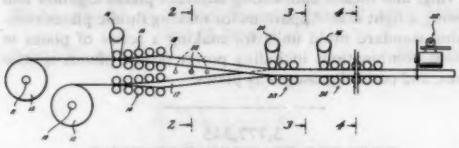


A tension band for suspending a rotatable measuring mechanism is composed of a metal alloy in which the ratio of the number of free electrons to the number of atoms is between about 4.15 to 4.5.

3,777,347
PANEL FORMING MACHINE

Raymond S. McCorvey, P. O. Box 405, Houston, Tex.

Filed Aug. 21, 1972, Ser. No. 282,562
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 A 5 Claims

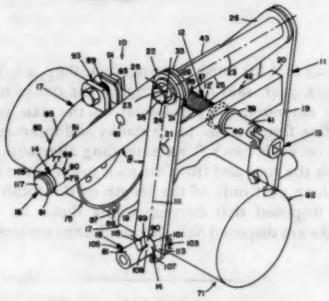


A panel forming machine in which two sheets of material such as sheet metal are fed from supporting arbors through die-forming means, spray means then sprays material into the space between the sheets of material, and dies then hold the sheets in the desired relationship while the material expands and gels.

3,777,348
HIGH CURRENT CABLE ENGAGEMENT TOOL

Kenneth F. Stone, Berkeley, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed May 31, 1972, Ser. No. 258,399
Int. Cl. B23p *19/00*; H05k *13/00*
U.S. Cl. 29—203 P 6 Claims



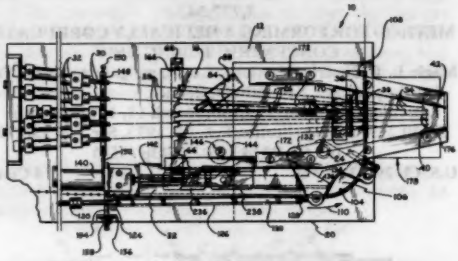
A tool for aiding in either engaging or disengaging large, heavy, electrical power plugs and receptacles having lug shaped ears. A special scissor shaped tool temporarily fits in rotatable engagement with the ears, and a screw mechanism on the tool rotates to force engagement or disengagement as desired. While the tool maintains azimuthal alignment of the plug and receptacle.

3,777,349
TERMINAL APPLICATOR

Ronald B. Barnes, Camp Hill, Pa., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed May 3, 1971, Ser. No. 139,522
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 B 10 Claims

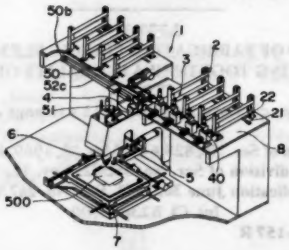
A terminal applicator for simultaneously mounting a plurality of terminals on a circuit board in a desired pattern includes a number of terminal gripping fingers extendable linearly from a pick-up position where each finger engages one of a number of regularly spaced terminals to a staking position where the terminals are held in a pattern different from their pattern at the pick-up position and staked to a circuit board. The axes of movement of the fingers are non parallel but lie in a common plane.



3,777,350
COMPONENT MOUNTING APPARATUS

Yoshinobu Maeda, Katano-shi, Osaka; Kazumi Takamori, Takatsuki-shi, Osaka, and Tadao Kanno, Yamatokoriyama, Nara-ken, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka-fu, Japan

Filed July 25, 1972, Ser. No. 275,046
Claims priority, application Japan, July 26, 1971, 46/56214; July 26, 1971, 46/56221; July 26, 1971, 46/56220; July 26, 1971, 46/56223; July 26, 1971, 46/56224; July 26, 1971, 46/56219; July 26, 1971, 46/56218; July 26, 1971, 46/56217; July 26, 1971, 46/56216; July 26, 1971, 46/56214; July 26, 1971, 46/56215; July 26, 1971, 46/56225; Mar. 28, 1972, 47/31033; July 26, 1971, 46/56222
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 B 14 Claims

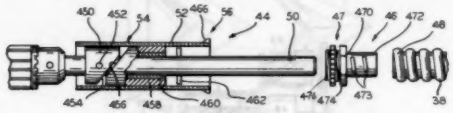


A component mounting apparatus for automatically inserting and clinching terminal projections extending in generally radial or parallel relation from their component or other bodies, which generally comprises a supply unit including a plurality of component magazines, a cutter unit for separating each one of the components from their supporting member, a feeder unit including an attitude control for adjusting the attitude of each one of the components fed thereto to a predetermined attitude, a retainer unit for delivering the component to a component inserting unit, the inserting unit including nippers for picking up and releasing the component and a clincher unit for clinching the terminal projections to secure the component on a workpiece.

3,777,351
DEVICE FOR PROCESSING FLEXIBLE METALLIC CONDUIT

William J. Fisher, Lisle, Ill., assignor to Maynard Braverman, Chicago, Ill., a part interest

Division of Ser. No. 1,735, Jan. 9, 1970, Pat. No. 3,672,015.
This application Dec. 27, 1971, Ser. No. 212,807
Int. Cl. H01r 43/04
U.S. Cl. 29—203 H 1 Claim

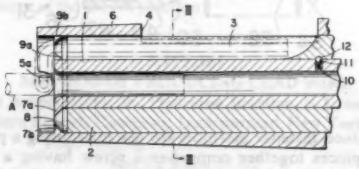


A machine and method for mechanically and simultaneously sizing and cutting multiple strands of flexible metallic conduit to desired lengths, and for facilitating the application of a fitting to either end of the respective resulting lengths, in which the conduit is simultaneously drawn by a roller drive, from a number of rolls of same in parallel strands and is fed past a cutting station the conduit length desired, after which feeding of the conduit strands ceases and the conduit lengths are simultaneously severed from the row of strands by sawing. The machine includes a device for mechanically rotating the individual end fittings for the conduit length ends, whereby the machine operator can individually manipulate the individual conduit length ends to apply same to the device to permit the end fitting for same to be mechanically rotated into its fully seated position in the conduit end, and an attachment that permits the conduit wiring to be mechanically fed into same and cut off at the right length to complete the conduit assembly.

3,777,352
APPARATUS FOR AUTOMATICALLY REMOVING THE COVERING FROM COVERED WIRE AND WINDING THE UNCOVERED WIRE ON A ROD MEMBER

Kazuo Nagayama, Kohoku-ku, Yokohama, Japan, assignor to Seiken Kogyo Kabushiki-Kaisha, Nakahara-ku, Kawasaki, Japan

Filed Aug. 31, 1972, Ser. No. 285,459
Claims priority, application Japan, May 12, 1972, 47/46479
Int. Cl. H01r 43/04
U.S. Cl. 29—203 D 7 Claims

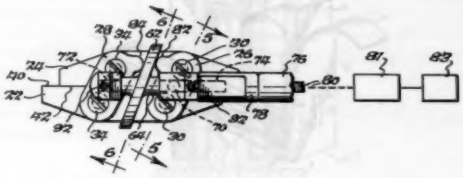


An apparatus having three coaxial tubular members. The intermediate tubular member is formed therein with an axial slot opening in the free end face of the member for receiving an end portion of a covered wire and is rotatable relative to the inner and outer tubular members which are held stationary against rotation and which have annular knife edges radially extending toward each other to define therebetween an annular gap of a radial dimension substantially equal to the diameter of uncovered wire. The knife edges are formed therein with radially aligned arcuate notches defining together a substantially circular opening with which the slot can be moved into axial alignment and through which the covered wire can be axially received at one end into the slot. The inner tubular member is adapted to axially receive a rod member. When the intermediate tubular member is rotated relative to the other tubular members with the portion of the covered wire outward of the knife edges being engaged with the rod member, the wire is wound on the rod member and drawn through the annular gap whereby the covering is removed from the covered wire located within the slot and the uncovered wire is successively wound on the rod member.

3,777,353
STRIP INSERTING APPARATUS

James F. Sharpe, Buffalo, N.Y., assignor to Acme Highway Products Corporation, Buffalo, N.Y.

Continuation-in-part of Ser. No. 40,570, May 26, 1970, Pat. No. 3,667,105. This application May 18, 1972, Ser. No. 254,611
Int. Cl. E01c 23/09
U.S. Cl. 29—235 15 Claims

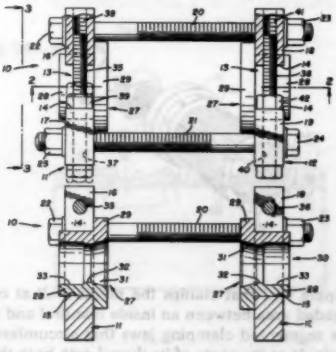


A sealing strip inserting apparatus comprising a pair of jaw members extending in a side-by-side relation and connected together by parallel links to form a parallelogram arrangement. A driven swash plate having opposite faces bearing against portions of such links effects relative axial movement between said jaw members in a step-by-step walking fashion along the strip. The apparatus is provided with a tapered groove for guiding and progressively inserting the strip into a slot. In lieu of the swash plate, a cam and follower arrangement can be utilized to actuate the jaw members.

3,777,354
PORTABLE HOSE MENDING APPARATUS

Philip C. Masters, Ashland, Ohio, assignor to McNeil Corporation, Akron, Ohio

Filed Feb. 25, 1972, Ser. No. 229,412
Int. Cl. B23p 19/04
U.S. Cl. 29—237 6 Claims



Disclosed is apparatus for mending breaks or tears in hoses, particularly high pressure hoses such as utilized in sewer

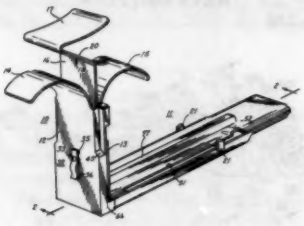
cleaning operations. Two die holding plates receive half of a split swaging die in a generally U-shaped slot therein. The two parts of the hose to be mended are put into a coupler and then placed on the dies within the slot of the plates. The other half of each die is placed on the hose and the dies can be locked in place. The die holding plates are attached to each other by opposed draw bolts which when simultaneously tightened will cause the dies to pass over the coupler and swage the same onto the hose. The apparatus can also be readily adapted to affix end fittings to hoses, if desired.

3,777,355

SURGICAL WOUND CLIP APPLIER WITH DISPOSABLE CLIP MAGAZINE

John R. Cooke, Four Mile Canyon, Boulder, Colo.

Filed July 24, 1972, Ser. No. 274,503
Int. Cl. B23p *11/00*; **E05b** *19/06, 19/26*
U.S. Cl. 29—243.56 **13 Claims**



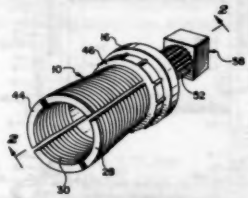
A surgical clip applier for surgical wounds is disclosed which is semi-automatic in operation, operated with one hand, easily disassembled or assembled without tools as for cleansing or sterilizing in an autoclave and includes a low cost disposable clip magazine. Individual clips are advanced to a position where they are applied selectively to the wounded area and, as soon as one has been applied and the mechanism released, the applier operates automatically to be ready for the next application. This enables the surgeon to close a wounded area in much shorter time than could be done by suturing, or by individually applying each clip.

3,777,356

PIPE NIPPLE TOOL

Joseph M. Hemingway, 14932 Avalon, Dolton, Ill.

Filed Apr. 4, 1972, Ser. No. 240,982
Int. Cl. B23p *19/04*
U.S. Cl. 29—428 **14 Claims**



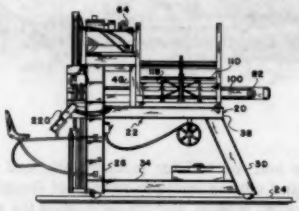
A pipe nipple tool that clamps the nipple wall at one end over its threaded area between an inside mandrel and outside contractable segmented clamping jaws that circumferentially engage the nipple at the roots of its thread with both the mandrel and clamping jaws interlocked to turn as a unit either to tighten or loosen a threaded joint involving the other end of the nipple.

3,777,357

MACHINE AND METHOD FOR SIMULTANEOUSLY FORMING A PLURALITY OF BUILDING SECTIONS

Robert J. Whitney, 11606 Amarillo Ct., Dublin, Calif.; Donald H. Gaston, 3066 McGraw, San Diego, Calif., and Joe A. Nickell, 3585 Dormer Ct., Concord, Calif.

Continuation of Ser. No. 120,894, March 4, 1971, abandoned. This application June 29, 1972, Ser. No. 267,582
Int. Cl. B23p *19/04, 19/00*
U.S. Cl. 29—429 **22 Claims**



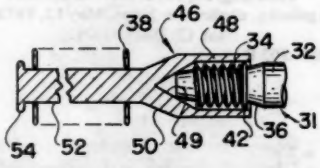
The machine includes mechanism for simultaneously extracting a layer of studs from a stack of studs, mechanism for conveying the layer of removed studs to between two pairs of stud retainer-bars, mechanism for fixing the studs to prelaid mud sills and plates and the method includes the steps carried out by the machine.

3,777,358

METHOD OF ASSEMBLYING A RETAINED FASTENER ASSEMBLY

William Matievich, Hatboro, Pa., and Harry A. Theakston, Tustin, Calif., assignors to Standard Pressed Steel Co., Jenkintown, Pa.

Division of Ser. No. 46,073, June 15, 1970, abandoned. This application Oct. 7, 1971, Ser. No. 187,538
Int. Cl. B23p *11/02*
U.S. Cl. 29—450 **2 Claims**



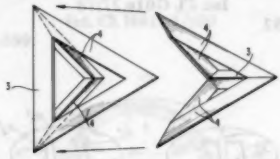
A retained fastener assembly for use in securing a plurality of workpieces together comprises a screw having a groove configuration including a conical surface and a radial shoulder with a flat face formed intermediate the ends of the shank. The screw is attached to a panel by placing the sleeve of a tool over the threaded portion of the shank and sliding a retaining ring over the tool until it snaps into the groove configuration. Thereafter, the ring cooperates with the flat face on the shoulder and the panel to prevent removal of the screw from the panel from one direction while the head prevents removal from the other direction. To assemble a joint, the panel carrying the fastener is placed adjacent another panel or workpiece having an aperture and a nut; the screw is then pushed through the ring and inserted into the aperture and engaged with the nut.

3,777,359

METHOD OF MAKING SKELETAL TETRAHEDRONS

Ernest Roger Bardot, Juziers, France

Filed Mar. 31, 1972, Ser. No. 240,053
Claims priority, application France, Apr. 2, 971, 71/11659
Int. Cl. B21d *39/02*
U.S. Cl. 29—463 3 Claims



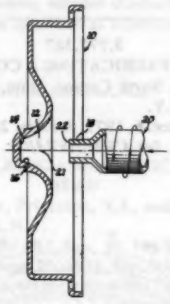
Skeletal tetrahedrons are formed by molding them in two halves and then joining the halves. Each half is comprised by a pair of triangles having a common base, the apices of the triangles being spaced apart a distance equal to the length of the base.

3,777,360

FRICTION WELDING PROCESS

Eugene E. Welch, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 23, 1972, Ser. No. 228,705
Int. Cl. B23k *27/00*
U.S. Cl. 29—470.3 4 Claims



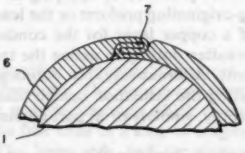
Friction welding process in which metallic workpieces are welded at end and side interface zones with substantially all flash squeezed radially inwardly into an opening in one of the workpieces at the axis of rotation.

3,777,361

METHOD OF PRODUCING CLAD WIRE

Francis Joseph Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Aug. 4, 1972, Ser. No. 277,892
Int. Cl. B23k *31/02*
U.S. Cl. 29—470.6 7 Claims



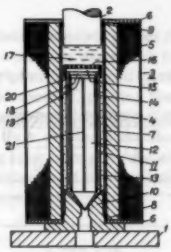
Aluminum rod of indefinite length is wrapped with a copper sheathing having a longitudinal lock seam and is then passed through hydrostatic extrusion apparatus. The heat and pressure of the extrusion process bond the copper to the aluminum and weld the lock seam as the copper-sheathed aluminum rod is extruded to produce copper clad aluminum wire of indefinite length. Materials other than copper and aluminum may be employed in the practice of the present invention.

3,777,362

METHOD OF MANUFACTURING RODS OR WIRE OF COMPOUND MATERIAL

Jan Nilsson, Robertsfors, and Bertram Brinkeborn, Vasteras, both of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Feb. 16, 1972, Ser. No. 226,759
Claims priority, application Sweden, Mar. 4, 1971, 2756/71
Int. Cl. B21d *39/04*
U.S. Cl. 29—474.3 8 Claims



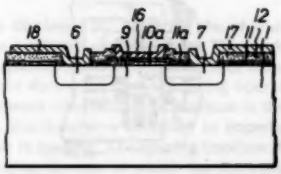
In manufacturing a rod or wire of compound material from a core of aluminum or aluminum alloy and a casing of copper or copper alloy by hydrostatic extrusion, a billet is used in which the core has a smaller external diameter than the internal diameter of the casing, so as to provide clearance therebetween sufficient that at least most damage to the casing during soft-annealing and handling will not be of sufficient extent to prevent the insertion of the core into a casing. An internal space is provided at the rear of the billet to collect the air present in the gap between the core and the casing as it is displaced when the core and casing are pressed into contact with each other.

3,777,363

METHOD OF MANUFACTURING A FIELD EFFECT TRANSISTOR

Werner Scherber, Holderlinstrasse 8, Nordheim, Germany

Filed Nov. 30, 1971, Ser. No. 203,388
Claims priority, application Germany, Dec. 1, 1970, P 20 58 930.4
Int. Cl. B01j *17/00*
U.S. Cl. 29—571 7 Claims



A method of manufacturing a field effect transistor includes the steps of: completely removing the masking oxide layer used during the diffusion of two spaced semiconductor regions at one surface of a semiconductor body of opposite conductivity type, applying a thin oxide layer to the surface between

the two-spaced regions, applying a thin nitride layer to the thin oxide layer and the remaining exposed parts of the same surface, applying a relatively thick oxide layer to the nitride layer, making first windows through the thick oxide and nitride layers over the two spaced regions and a second window through the thick oxide layer between the two regions and forming metal contacts in the first windows and a metal gate electrode in the second window.

3,777,364

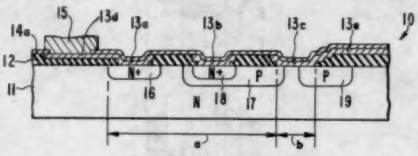
METHODS FOR FORMING METAL/METAL SILICIDE SEMICONDUCTOR DEVICE INTERCONNECT SYSTEM

Richard D. Schinella, Mountain View, and William H. Herndon, Sunnyvale, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Division of Ser. No. 135,965, April 21, 1971, abandoned. This application July 31, 1972, Ser. No. 276,333

Int. Cl. B01j *17/00*

U.S. Cl. 29—578 **7 Claims**



A silicide of a selected metal, typically platinum, is used to form an interconnect layer of conductive material on a semiconductor device. The silicide is, in one embodiment, formed by combining a layer of polycrystalline semiconductor material, formed into the desired interconnective lead pattern, with metal from a layer of metal formed over the polycrystalline semiconductor material. By oxidizing the region of the polycrystalline material not combined with the metal to form the metal silicide, the step height between the oxidized polycrystalline material and the metal silicide interconnect is significantly reduced relative to the interconnect structure of the prior art integrated circuits.

3,777,365

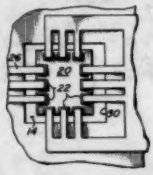
CIRCUIT CHIPS HAVING BEAM LEADS ATTACHED BY FILM STRIP PROCESS

Charles Wayne Umbaugh, Phoenix, Ariz., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Mar. 6, 1972, Ser. No. 232,029

Int. Cl. B01j *17/00*

U.S. Cl. 29—591 **3 Claims**



Circuit chip devices having beam leads are manufactured by first attaching leads formed on a film strip carrier to the chip, and then severing the lead ends to free the beam leaded chip from the carrier.

3,777,366

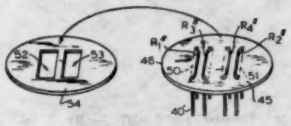
CHAMBER AND FILAMENT METHOD FOR FLOW THROUGH THERMAL CONDUCTIVITY MICRO SIZE MEASURING CHAMBERS

Michael Edward Kiefer, Raleigh, N.C., assignor to Trienco, Inc., Raleigh, N.C.

Continuation of Ser. No. 143,836, May 17, 1971, Pat. No. 3,704,984. This application June 21, 1972, Ser. No. 264,955

Int. Cl. G01n *27/18*

U.S. Cl. 29—592 **11 Claims**



A chamber and filament method of chamber formation and filament support for micro size, i.e. 10 microliters or less, thermal conductivity measuring chambers is based on supporting the detecting filaments on a suitable relatively thin electrically and thermally insulating substrate, e.g. mica, and utilizing the wall support surface of the substrate as a significant portion of the total wall surface of the detecting chamber thereby mechanically stabilizing the filaments, minimizing the chamber size and dramatically increasing the ability of the chamber to detect the presence and concentration of minute quantities of unknowns, e.g. insecticide on a lettuce leaf.

3,777,367

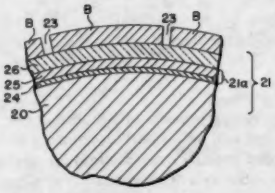
METHOD OF FABRICATING A COMMUTATOR

Memorial Kalagidis, North Canton, Ohio, assignor to Ametek, Inc., New York, N.Y.

Filed Dec. 6, 1971, Ser. No. 205,267

Int. Cl. H01r *43/00*

U.S. Cl. 29—597 **9 Claims**



In fabrication of commutators by applying a thin insulation coating on a cylindrical support and thereafter applying a thin conductive layer ultimately providing the conductive segments by plasma or flame spray techniques, a bonding layer is layed before the insulating layer; and further electrical connections for armature coil leads, either in the form of tangs or direct connections are provided by applying to the insulating layer either a tang-originating preform or the lead ends before flame spraying of a copper layer for the conductive bars or segments and thereafter slotting to define the tanged or lead-connected segments. Alternatively, bar defining slots can be produced by masking the insulation coated blank before the final layer flame spray, wholely or in part eliminating slotting operations.

A dove tail interlock between the bars and core may be achieved by using a core with longitudinal trapezoidal section slots and carrying out the bar slotting centrally of each of the core slot locations.

3,777,368

METHOD OF PRODUCING A COMPOSITE TUBULAR SUPERCONDUCTOR

Hans Pfister, and Heinrich Diepers, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 10, 1972, Ser. No. 279,388
Claims priority, application Germany, Aug. 19, 1971, P 21 41 636.4
Int. Cl. H01v *11/00*
U.S. Cl. 29—599 18 Claims

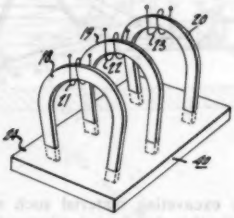
A method of producing tubular conductors includes bending a conductor band to abut the longitudinal edges thereof to form a tube. The conductor band includes a layer of niobium adjacent a layer of an electrically normal conducting metal and ribbon-like niobium chords that define the respective longitudinal edges of the band. After the tube is formed, the niobium chords are joined to each other. The method is especially suited for producing tubular conductors for superconducting cables and the like such as superconducting alternating-current cables.

3,777,369

METHOD OF MAKING A MAGNETIC RECORDING HEAD

Rabah A. Shahbender, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 685,491, Nov. 24, 1967, abandoned. This application Sept. 20, 1971, Ser. No. 182,104
Int. Cl. G11b *5/42*; H01f *7/06*
U.S. Cl. 29—603 3 Claims



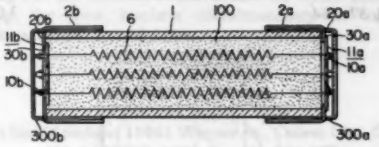
There is disclosed a magnetic transducer and method of manufacturing the same. The transducer comprises a body of high reluctance material through which apertures are drilled for accepting the free ends of a loop of magnetically permeable material. The loop ends and the surface of the body through which they project are machined to form a smooth planar surface in which the loop ends are separated by the desired gap dimension.

3,777,370

METHOD OF MAKING CYLINDRICAL FUSE

Toshio Wakui, Kawasaki-shi, Kanagawa-ken, Japan, assignor to Fuji Denki Seizo Kabushiki Kaisha, Kawasaki-shi, Kanagawa-ken, Japan

Filed Feb. 4, 1972, Ser. No. 223,495
Int. Cl. H01h *69/02*
U.S. Cl. 29—623 4 Claims



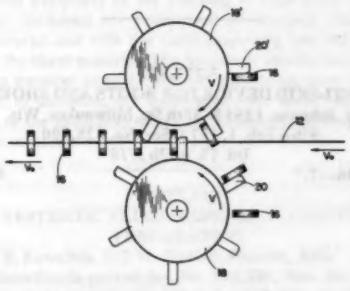
A method for producing electric power fuses comprising the steps of preparing two circular discs each having a central hole and a plurality of peripheral slits, and each slit having a lug at the radially inner end thereof, placing the circular discs at a predetermined distance, inserting fuse elements in the slits so that two ends of the fuse elements are fixed around the lugs, slipping an insulating tube over the fuse elements thus assembled, and filling the interior of the insulating tube with an arc extinguishing substance.

3,777,371

METHOD OF CONTROLLING THE CHARACTERISTICS IMPEDANCE OF COAXIAL CABLES

Rama Iyengar, Dollard Des Ormeaux, and Dan Bryan Davis, Ile Perrot, Quebec, both of Canada, assignors to Northern Electric Company, Limited, Montreal, Quebec, Canada

Filed Feb. 16, 1972, Ser. No. 226,881
Int. Cl. H01b *13/20*
U.S. Cl. 29—624 4 Claims



A method is disclosed for adjusting the characteristic impedance of disc insulated coaxial cables. The method consists of varying the spacing between adjacent discs mounted on the center conductor during the manufacturing operation. An increase in impedance results from an increase in the spacing of the discs and, conversely, a decrease in impedance results from a decrease in spacing. The spacing between discs may be varied by changing the rate at which the discs are applied to the conductor which is moving at a constant linear speed.

ERRATA

For Classes 30—124 thru 36—71 see:
Patents Nos. 3,777,396 thru 3,777,419

3,777,372

CUTTER SUCTION DREDGE HAVING PARALLELOGRAM LINKAGE WAVE COMPENSATOR

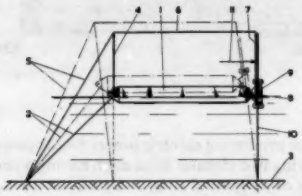
Johannes Bertus Laarman, Swijndrecht, Netherlands, assignor to N.V. Industrieele Handelscombinate Holland, Rotterdam, Netherlands

Filed July 22, 1971, Ser. No. 165,125

Claims priority, application Netherlands, July 22, 1970, 7010848

Int. Cl. E02f *3/88*

U.S. Cl. 37—64 **3 Claims**



A cutter dredge comprises a pontoon pivotally mounted on a spud driven into the sea bed, by means of a guide element vertically movable on the spud. The pontoon carries a cutter ladder pivotally on its end opposite the spud; and the lower end of the ladder is maintained at a predetermined elevation despite the wave motion of the spud and pontoon, by means of a parallelogram linkage having the pontoon as the lower side and having parallel sides upstanding from opposite ends of the pontoon and pivotally connected to the pontoon. The side of the parallelogram linkage at the cutter end of the pontoon is secured to the pontoon. The opposite side of the parallelogram linkage can be either a rod upstanding from the guide element, or a portion of the spud itself. The upper ends of the two upright sides are interconnected by a horizontal cable or stay.

3,777,373

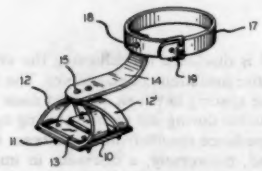
ANTI-SKID DEVICE FOR BOOTS AND SHOES

Gladys M. Johnson, 1251 S. 35th St., Milwaukee, Wis.

Filed Feb. 1, 1973, Ser. No. 328,790

Int. Cl. A43b *3/18*

U.S. Cl. 36—7.7 **4 Claims**



An anti-skid cleat for the toe of a shoe or boot. The cleat is attached to the shoe or boot by means of a crossed pair of straps in an X-shaped configuration which are connected to an akle band by means of a strap connected to the cross points of the X shape.

3,777,374

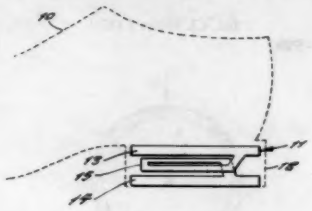
PLEASURE SHOE

Leslie Hendricks, P.O. Box 111, Russell Springs, Ky.

Filed July 19, 1972, Ser. No. 273,285

Int. Cl. A43b *21/30*

U.S. Cl. 36—38 **1 Claim**



A footwear device that makes walking or standing a pleasure by aiding in prevention of foot and leg fatigue by putting a "bounce" in every step; the device consisting of a compression spring unit that is fitted into each shoe heel and which includes a bottom base member and top base member that are spaced apart and parallel to each other, the base members being interconnected by an integral, resilient, compression coil spring therebetween and which absorbs the shock of walking and which cushions the underside of a person's heel.

3,777,375

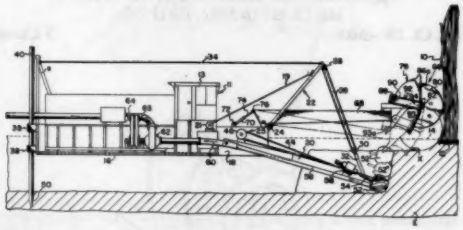
SUCTION DREDGE WITH BRUSH CUTTING ATTACHMENT

Leward N. Smith, Millbrook Rd., Rt. 1, Remus, Mich.

Filed Jan. 28, 1972, Ser. No. 221,538

Int. Cl. E02f *3/90*

U.S. Cl. 37—67 **20 Claims**



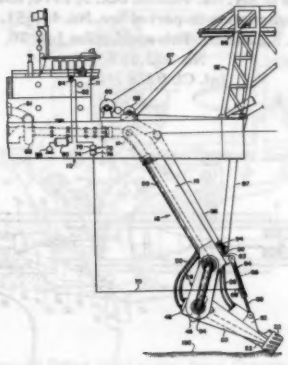
Apparatus for excavating material such as earth, trees, brush, roots and the like, and removing it as a slurry, to make a lake or enlarge existing waterways, comprising: an underwater dredge having a material-removing cutterhead for digging and collecting material to be dredged which is movable in a to-and-fro, lateral path of travel, suction apparatus for removing the material from the cutterhead in slurry form and transferring it to a remote location, and a chipping wheel assembly movable with said cutterhead for removing an upper layer of earth, reducing the trees, roots, and brush to chips or pieces, and directing the reduced or comminuted material into the path of the cutterhead to be removed thereby to the remote location.

3,777,376

ARTICULATED LADDER CONSTRUCTION FOR CUTTERHEAD DREDGE

Thomas M. Turner, Severna Park; Francis J. Keefe, and Charles D. Little, both of Baltimore, all of Md., assignors to Ellicott Machine Corporation, Baltimore, Md.

Filed Feb. 4, 1972, Ser. No. 223,482
Int. Cl. E02f *3/90*
U.S. Cl. 37—67 9 Claims



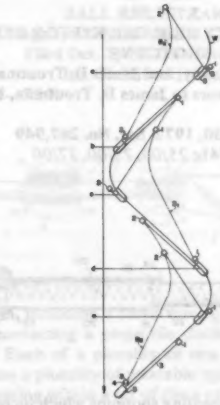
An articulated ladder for a cutterhead dredge especially adapted for use in rough water and wherein the ladder, rather than being a unitary rigid member, is constructed in two parts connected together at adjacent ends by a link whereby the thrust due to wave action on the ladder part trunnioned to the dredge cannot be transmitted to the cutterhead and, by reaction of the latter against the bottom, back to the trunnions.

3,777,377

METHOD OF COLLECTING SUBMARINE RESOURCES

Masatoshi Toritani, 4-26, Naritahigashi 5 chome, Suginami-ku, Tokyo, Japan

Filed Oct. 27, 1971, Ser. No. 193,033
Int. Cl. E02f *1/00*
U.S. Cl. 37—195 4 Claims



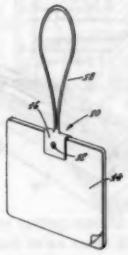
The method of collecting submarine resources is practised by a collecting vessel provided with a pair of buckets which are adapted to be raised or lowered alternately. The vessel is steered so that a meandering wake is formed, and for every passage of the vessel around the turning point of the meandering wake, one of the buckets is lowered from the vessel toward the bottom of a river or sea and concurrently the other bucket is raised from the bottom to the vessel. While one of the buckets is on the vessel for collection of gathered resources therefrom, the other bucket is dredging through the bottom of the water for accumulating resources therein. The system for carrying out the method is provided with winch means for hoisting the two buckets simultaneously in opposite directions, that is, up and down.

3,777,378

REINFORCING PATCH

Robert Sant'Anselmo, 11001 Wagner St., Culver City, Calif.

Filed June 19, 1972, Ser. No. 264,025
Int. Cl. G09f *3/02*
U.S. Cl. 40—27 9 Claims



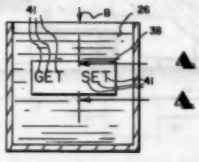
A reinforcing patch for reinforcing an opening through sheet material including a pair of spaced plate members interconnected by a hinge member to form a U-shaped reinforcing patch and with a pair of openings extending in line through both plate members and with a plurality of teeth extending inwardly from each plate member and with the teeth spaced around the periphery of the opening in each plate member. The plate members are positioned on opposite sides of the sheet material and with the teeth extending into the opening through the sheet material. The invention also includes the use of a loop member integral with and extending from the hinge member. In addition, the teeth may abut each other in the opening or the teeth may interlock within the opening through the sheet material.

3,777,379

AESTHETIC FLUID SUSPENSION AND ITS PREPARATION

William B. Lewellen, 212 W. McNeil, Phoenix, Ariz.

Continuation-in-part of Ser. No. 593,850, Nov. 16, 1966, abandoned. This application Mar. 7, 1969, Ser. No. 805,188
Int. Cl. A63j *5/00*; B29d *27/04*; G09f *13/24*
U.S. Cl. 40—106.21 21 Claims



A method for producing an aesthetic field suspension comprising preparation of a body of gelatinous material having

high yield value, then inserting a similar gelatinous material of similar characteristics therein, said similar gelatinous material being optically contrasting with said body of gelatinous material, then allowing the high yield value of the materials to hold the similar material in said body material in substantially permanent position relative to said body; the disclosure further and specifically defining a method for inserting the similar material in said body in frozen form or by means of a hollow tubular member which may be moved around in the body during the insertion of the similar material therein to form geometric or other aesthetic patterns of the similar material in the body material; the disclosure also defining a novel product related to said method.

3,777,380

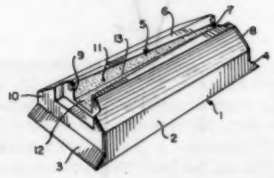
GUNSIGHT

Paris Theodore, 24 E. 73rd St., New York, N.Y.

Filed Dec. 23, 1971, Ser. No. 211,390

Int. Cl. F41g *1/00*

U.S. Cl. 42—1 S **23 Claims**



A gunsight including a rear notch and a relatively smaller front notch, preferably in the form of a block of material having an open channel, formed therein and converging from a rear notch to a front notch, the sides of said channel preferably being of a light color such as yellow. Optionally, one or more lips may be mounted at predetermined distances in front of the front notch to provide elevation angle indices for firing at longer ranges, the lips preferably being provided with notches or marks to assist in determining the range of the target.

3,777,381

FIREARM CARRYING HANDLE AND SIGHT PROTECTOR

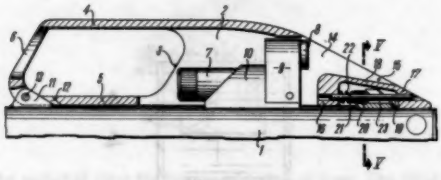
Tilo Moller, Oberndorf, ob der Sulzhalde, and Dieter Ketterer, Oberndorf/Neckar, both of Germany, assignors to Heckler & Koch GmbH, Oberndorf/Neckar, Germany

Filed May 12, 1971, Ser. No. 142,608

Claims priority, application Germany, May 13, 1970, P 20 23 270.6

Int. Cl. F41g *1/00*; F41c *27/00*

U.S. Cl. 42—1 S **7 Claims**



A hand firearm incorporates a carrier handle at about the centre of gravity of the firearm which carrier handle is of generally tubular shape which is adapted to protect a sight such as a telescopic sight giving a smooth outer surface not likely to become entangled with undergrowth or otherwise impede usage of the firearm. Side apertures in the tubular member provide an easy hand hold.

3,777,382

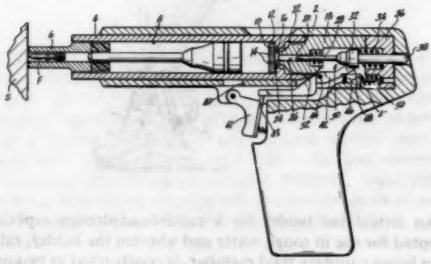
CASELESS PELLET IGNITING MECHANISM

Lawrence J. Brunelle, East Haven, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 94,835, Dec. 3, 1970, abandoned, which is a continuation-in-part of Ser. No. 45,651, June 12, 1970, Pat. No. 3,659,768. This application July 20, 1972, Ser. No. 273,657

Int. Cl. B25c *1/12*

U.S. Cl. 42—1 R **2 Claims**



A firing chamber is provided which peripherally surrounds a pellet of caseless propellant at spaced intervals only, with intermediate portions of the pellet being peripherally unsupported. A striking mechanism having a tapered nose for impacting the pellet is provided, with the tapered striker nose being operative to punch out a portion of the pellet and compress that punched out portion against an anvil to ignite that portion. The tapered striker nose is also operative to cause fracturing of the remainder of the pellet along lines generally extending from the punched-out area to the unsupported peripheral portions of the pellet. The fracturing thus induced aids greatly in rapid and complete combustion of the entire pellet.

3,777,383

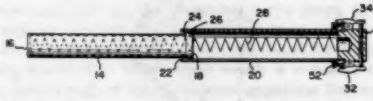
MAGAZINE CAPACITY REDUCER KIT FOR REPEATING SHOTGUNS

David E. Haines, Fort Ashby, and James D. Troutman, Keyser, both of W. Va., assignors to James D. Troutman, Keyser, W. Va.

Filed June 30, 1972, Ser. No. 267,949

Int. Cl. F41c *25/08, 25/00, 27/00*

U.S. Cl. 42—49 A **6 Claims**



A magazine kit for repeating shotguns which includes an extensible plug adapted to be readily inserted into and removed from the magazine of the shotgun. The kit serves to modify the magazine to facilitate loading and unloading of the magazine as well as to reduce the capacity when desired.

3,777,384

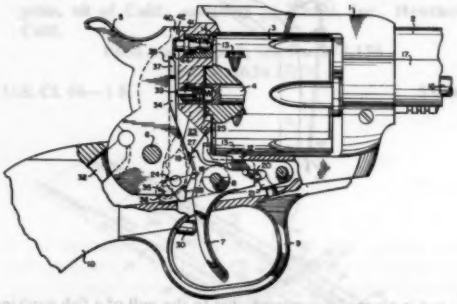
MECHANISM FOR SINGLE ACTION FIREARM

William B. Ruger, Southport, and Lawrence L. Larson, Bethany, both of Conn., assignors to Sturm, Ruger & Co. Inc., Southport, Conn.

Continuation-in-part of Ser. No. 198,752, Nov. 15, 1971, abandoned. This application May 5, 1972, Ser. No. 250,824

Int. Cl. F41c *17/08, 1/00, 19/00*

U.S. Cl. 42—66 18 Claims



An improved firing mechanism for a firearm having an external hammer that is not rotated to its cocked position by the trigger when the trigger is pulled but which rotates the trigger to its ready-to-fire position when the hammer is manually cocked. The improved mechanism comprises a vertically disposed and movable trigger bar pivotally connected to the trigger, the upper end portion of the trigger bar being disposed in front of the hammer and being movable from its lower position to its upper position when the trigger is rotated from its rest position to its ready-to-fire position. Trigger bar blocking means engage the upper end of the trigger bar and prevent upward movement of the trigger bar when the hammer is at rest, and hammer blocking means engage a forward facing surface of the hammer and prevent forward movement of the hammer and firing pin against a cartridge in the chamber when the trigger is in its lower position. The upper end portion of the trigger bar is positioned relative to the hammer so that the hammer and firing pin can strike and fire a cartridge in the chamber when the trigger bar is in its upper position.

3,777,385

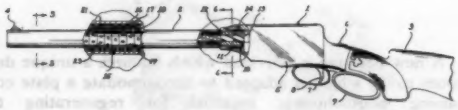
BALL RIFLED BARREL

Edward A. Hagan, 617 S. La Ville Pl., Tucson, Ark.

Filed Oct. 2, 1972, Ser. No. 294,281

Int. Cl. F41c *21/00, 21/02*

U.S. Cl. 42—76 R 9 Claims



A firearm, including a barrel having a plurality of spherical bearings contacting a projectile discharged therethrough, is disclosed. Each of a plurality of sets of centrally apertured discs retains a plurality of rotatable spherical bearings. A part of each bearing within a set of discs extends into the centrally disposed aperture. The sets of discs are mounted adjacent one another within a sleeve to form a barrel for a firearm. The bore of the firearm is defined by the innermost extensions of the spherical bearings within a set of discs. A key way within each of the discs with a helically formed key extending adjacent the inner surface of the sleeve to angularly position each of the discs about its longitudinal axis. The spherical bearings of the positioned discs thereby define a number of helixes within the bore of the barrel, where the number of helixes corresponds to the number of spheres retained by a set of discs.

3,777,386

TOY PISTOLS

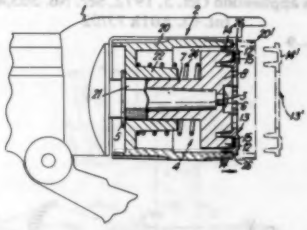
Harry John William Eagles, Newport, England, assignor to The Crescent Toy Company Limited

Filed Nov. 17, 1971, Ser. No. 199,608

Claims priority, application Great Britain, Dec. 15, 1970, 59,550/70

Int. Cl. F41c *3/06*

U.S. Cl. 42—58 2 Claims



A toy pistol includes spring-loaded cylinder comprising an inner part which is fixed in an axial direction and is provided with a ring of firing pins for the reception of a ring of caps. An outer shell surrounds the inner part and is capable of sliding in a longitudinal direction between a forward position in which its rear edge is overlapped by a part of a ring of caps in position on the firing pins and a rearward position, movement into which frees the ring from the firing pins. The outer shell may be spring-loadd into its forward position. Also the inner part may be formed with a ring of teeth for cooperation with an indexing finger on the hammer mechanism.

3,777,387

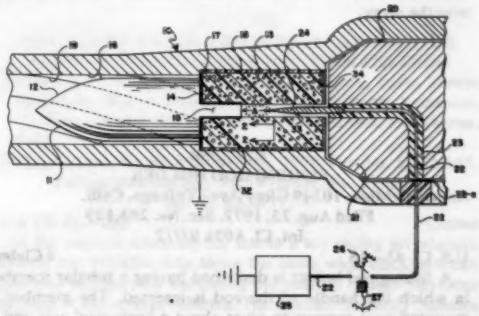
FIREARM AND CARTRIDGE THEREFOR

Harold W. Ritchey, Langhorne, Pa., assignor to Thiokol Chemical Corporation, Bristol, Pa.

Division of Ser. No. 737,128, June 14, 1968, Pat. No. 3,563,177. This application Nov. 2, 1970, Ser. No. 86,361

Int. Cl. F41c *19/12*

U.S. Cl. 42—84 16 Claims



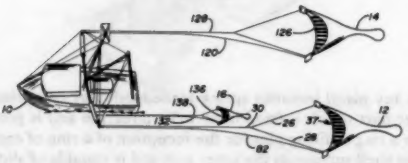
A combination of a reciprocating bolt, closed breech-type of firearm and an ammunition round comprising a caseless

charge and projectile which is adapted to be fired by means of an electrical discharge between the end of an ignition probe mounted in the firearm and the projectile attached to the charge. The charge is of the caseless type and is porous, being made from comminuted, or particulated combustible materials having the surface of each particle softened with a solvent and gently consolidated in a combustible tube or cover.

3,777,388
SHRIMP FISHING APPARATUS

James L. Newman, 1321 Glen Cove, Richardson, Tex., and Millo Marion Hawthorne, 4824 Overton, Forth Worth, Tex.

Continuation of Ser. No. 883,187, Dec. 8, 1969, abandoned. This application Oct. 3, 1972, Ser. No. 303,413
Int. Cl. A01k *73/02*
U.S. Cl. 43—9 **21 Claims**



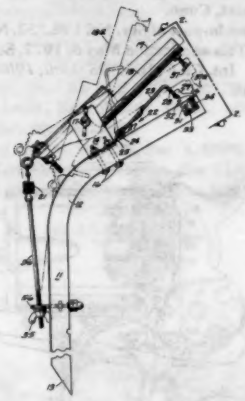
An apparatus for daylight shrimp fishing is disclosed. The apparatus includes a plurality of Otter trawls each having an electrode array and a pulse circuit. Each pulse circuit includes a capacitor which is discharged by a reversal of current to the capacitor which fires an SCR. A control unit located on the boat effects the discharging of the respective capacitors in a predetermined sequence to equalize the load on an alternating current generator. The electrode array has a plurality of electrodes which trail behind a bus extending between the trawl doors at a distance above the bottom. The electrodes are weighted to slide along the bottom and have an insulating material disposed above the conductor so that the electric current pulses are directed into the bottom rather than being dissipated upwardly into the water. The design of the bus and the electrode array is such as to insure uniform current density over the array.

3,777,389
FISHING ROD HOLDER

Angelo DeMino, 10349 Glory Ave., Tujunga, Calif.

Filed Aug. 23, 1972, Ser. No. 283,129
Int. Cl. A01k *97/12*
U.S. Cl. 43—15 **9 Claims**

A fishing rod holder is described having a tubular member in which the handle of the rod is inserted. The member is mounted on a support to pivot about a horizontal axis and is engaged by an adjustable spring to prevent the weight of the rod from pivoting it downward. Between the member and the support forward of the pivot is mounted a mouse-trap like spring, and means for cocking the trap spring under force. A spring release is provided to trigger the trap spring whenever

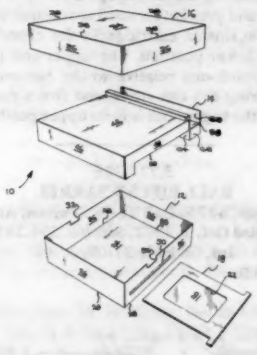


the rod is pivoted downward, due to the pull of a fish working against the action of the adjustable spring.

3,777,390
PHOTOCHROMIC MATERIAL REGENERATION PACKAGE

Robert L. Charlesworth, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed July 28, 1972, Ser. No. 275,948
Int. Cl. A63h *33/00*
U.S. Cl. 46—1 L **3 Claims**



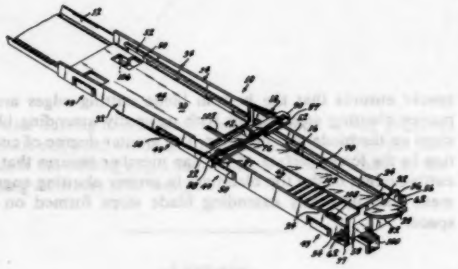
A new package is provided which features a unique dark room cavity which is adapted to accommodate a plate containing photochromic material for regenerating the photochromic material to its original color after all or a portion of the photochromic material has changed color as a result of exposure to direct sun rays. The package may be formed of cardboard, chipboard, paperboard, or corrugated paperboard. A tray-like base member is provided which includes a bottom panel and four opposed side panels which are fastened together at the corners to form four side walls perpendicular to the bottom panel. One of the side walls is slotted so that the plate of photochromic material may be inserted into the base member. An insert member is positioned within the base member and includes a top panel which is elevated to

a position overlying and separated from the bottom panel so as to define a dark room cavity therebetween for receipt and regeneration of the plate of photochromic material. A telescoping lid member may be positioned over and into mating relationship with the base member to completely close the package.

3,777,391
SIMPLIFIED TOY LAUNCHER

Jack L. Barcus, Cerritos; Eugene J. Kilroy, Jr., Inglewood; Marius J. Morin, Torrance, and John C. Parker, Los Angeles, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Aug. 4, 1972, Ser. No. 278,158
Int. Cl. A63h *17/00*
U.S. Cl. 46—1 K 5 Claims

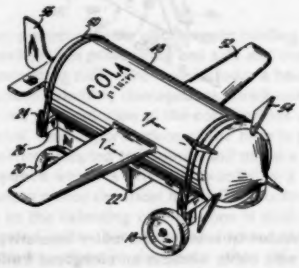


A toy vehicle launcher which includes a one-piece foldable frame, a slide, and a rubber band for propelling the slide forward to launch a toy vehicle along the frame, wherein the launcher can be easily changed from a small flat package configuration to a longer and taller use configuration. The frame has two base portions, two side walls, and an end wall, connected together by thin webs that form living hinges, and the base portions have projections that snap over portions of the side walls when the side walls are pivoted to an upright position to retain them thereat.

3,777,392
TOY

Samuel Span, 447 Ogden Ave., Teaneck, and Walter Thum, 12-42 Sunnyside Dr., Fair Lawn, both of N.J.

Division of Ser. No. 861,114, Sept. 25, 1969. This application Jan. 12, 1972, Ser. No. 217,050
Int. Cl. A63h *33/06*
U.S. Cl. 46—17 2 Claims

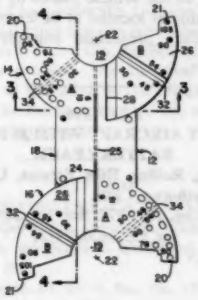


A toy in which random household articles may be assembled to a chassis for realizing a movable toy. The chassis frame retains a front axle and a rear axle upon which wheels are rotatably mounted to enable the chassis to move translationally. Spike-shaped members project upward from the chassis frame for penetrating into an article made of soft material and mounted on top of the chassis to form the body of a vehicle. Peg-shaped members projecting downward from beneath the chassis frame permit an article to be held to the chassis frame through flexible bands. Various elements are attachable to the article to render a vehicle-driven toy.

3,777,393
CONSTRUCTION TOY

Stephen C. Baer, Corrales, N. Mex., assignor to Operations Analysis Inc., Worcester, Mass.

Filed Mar. 13, 1972, Ser. No. 234,122
Int. Cl. A63h *33/08*
U.S. Cl. 46—25 6 Claims



An educational toy for constructing three dimensional, geometric figures by combining together numerous unitary planar construction members each having an array of holes and array of pins. Each construction member has two wing-shaped elements joined by a hinge at the longitudinal axis of the member and two hinges in each end of the member. The hinges permit the member to be deformed into the edges and corner of various polyhedra. The arrays of holes and pins have a circular symmetry about each end of the member. The construction members mate together by attaching the portion of the member containing pins to a corresponding portion on another member containing holes. The circular symmetry of the arrays of holes and pins permits the members to mesh together in selectable angular relationships.

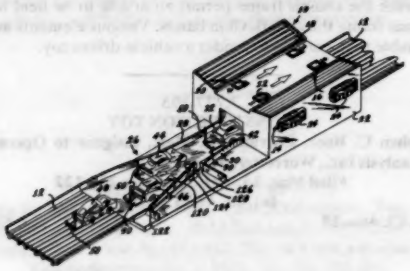
3,777,394
TOY VEHICLE WITH ADJUSTABLE LAP COUNTER ACTIVATOR REMOVABLY MOUNTED THEREON

William A. Staats, Torrance; Denis V. Bosley, Palos Verdes Peninsula; John S. Cook, Sunnyvale, and Toshio Yamasaki, Gardena, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Division of Ser. No. 96,808, Dec. 10, 1970, Pat. No. 3,712,615. This application July 31, 1972, Ser. No. 276,482
Int. Cl. A63h *17/00*
U.S. Cl. 46—202 3 Claims

A lap counter assembly for use in a toy racing set wherein several toy vehicles race along the same wide track and can pass one another, for indicating the number of laps traversed by each of the several vehicles. The counter assembly includes a track region which narrows from a multi-lane width to a single lane width, and several counters which have trip members which can be struck by vehicles to advance the counts, wherein the trip members are located at different lateral posi-

tions across the width of the single lane track region. An attachment is provided for each vehicle, which includes an upwardly projecting member for moving one of the trip members



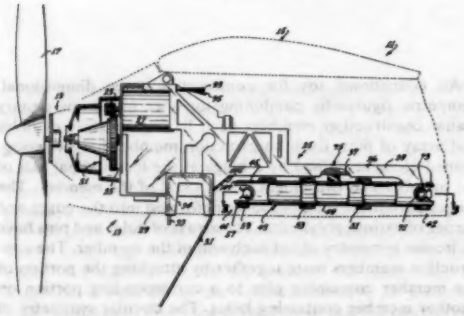
to register a count as the vehicle passes by it, the projections on the different vehicles located at different lateral positions thereon so that each projection engages a different trip member.

3,777,395

FLYABLE TOY AIRCRAFT WITH JETTISONABLE BATTERY PACK

Richard S. Chang, Rolling Hills Estates, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Aug. 29, 1972, Ser. No. 284,532
Int. Cl. A63h *29/22*
U.S. Cl. 46—243 AV **10 Claims**



An improvement in a flyable toy aircraft of the type having a battery-powered, electric motor-driven propeller wherein the battery pack is releasably held to the aircraft fuselage assembly and simultaneously electrically connected to the toy's electric motor, the electrical connector and release mechanism holding the battery pack in position and completing the motor current supply circuit until the incidence of a crash-induced impact force at the forward end of the toy's fuselage assembly.

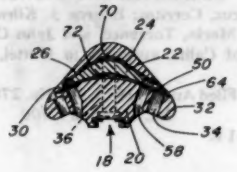
3,777,396

CARTRIDGES HAVING TANDEMLY MOUNTED CUTTING EDGES ON TWO SIDES THEREOF

Sergio Simonetti, Westport, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed June 1, 1972, Ser. No. 258,683
Int. Cl. B26b *21/00, 21/20, 21/52*
U.S. Cl. 30—32 **11 Claims**

The specific disclosure provides a bonded blade cartridge having two double edge blades separated by a spacer rigidly secured between a cap member and a blade seat member. Transverse center portions of the lower surfaces of the cap member and of the spacer are curved to a greater degree than respective corresponding transverse center portions of the upper surfaces of the spacer and of the blade seat member. The greater degree of curvature of the lower surface of the



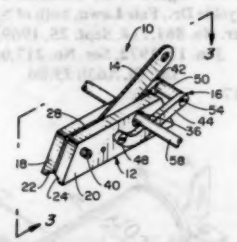
spacer ensures that the bottom blade cutting edges are in proper abutting engagement with upwardly extending blade stops on the blade seat member. The greater degree of curvature in the lower surface of the cap member ensures that the cutting edges of the top blade are in proper abutting engagement with upwardly extending blade stops formed on the spacer.

3,777,397

SHIELDED CABLE STRIPPER

William K. Johnson, 17586 Chestnut St., Fountain Valley, Calif.

Filed May 30, 1972, Ser. No. 257,911
Int. Cl. B21f *13/00*
U.S. Cl. 30—90.6 **1 Claim**



An apparatus to remove the outer insulative jacket of an electrical wire cable wherein an elongated knife blade is fixedly positioned between a pair of housing members, an opening is formed through the housing transverse to the knife blade with the edge of the blade extending within the opening, the point of the knife blade communicating with an elongated groove formed within the edge of the housing members.

3,777,398

WIRE CUTTING TOOL

Esse Edgar Routh, Jr., 6 Hemlock Rd., Bronxville, N.Y.

Filed Jan. 20, 1972, Ser. No. 219,231
Int. Cl. B26b *17/04*
U.S. Cl. 30—124 4 Claims

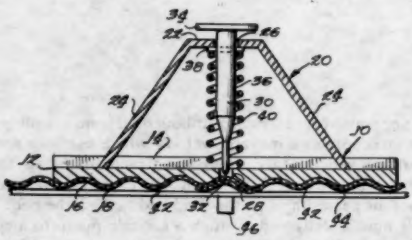
A wire cutting tool is shown and described having gripping members disposed within and resiliently connected to the jaws adjacent the cutting edges such that wire ends are held by the gripping members after being cut.

3,777,399

PUNCH UNIT

Lee A. Rockel, P. O. Box 421, Dallas City, Ill.

Filed Aug. 12, 1971, Ser. No. 171,186
Int. Cl. B26f *1/02*
U.S. Cl. 30—361 5 Claims



A unit for pre-piercing sheets of corrugate roofing and siding to permit both proper positioning and safe and convenient driving of the mounting nails. The unit includes a base having on its lower surface orienting corrugations which correspond in general size and configuration to the corrugations or ribs in the sheet material. The upper surface of the base is provided with a guide portion adapted to support and guide a reciprocally movable punch which is driven forwardly by a hammer blow, or the like, to pierce the sheet metal. The position of the punch relative to the orienting corrugations is such that the perforations formed in the sheet metal are located at the peak or top of the corrugations in the sheet. after this piercing operation, a nail may be driven easily and safely through the perforation and into the underlying wood support without the dangers and problems normally encountered in attempting to drive the nail through one or more layers of unperforated sheet metal.

3,777,400

CLIPPING APPARATUS AND CLIPS THEREFOR

Karl A. Klenz, Oakland, and Clyde R. Velarde, Hayward, both of Calif., assignors to Rheem Manufacturing Company, New York, N.Y.

Filed Aug. 28, 1971, Ser. No. 175,085
Int. Cl. B65d *83/00*
U.S. Cl. 206—56 AB 3 Claims

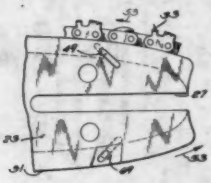
A clipping apparatus for forming a closure around the neck of a bag of flexible material or the like. Clips are supplied to the apparatus in the form of an elongated prestamped strip of planar sheet material which is wound on a supply reel. The strip is then formed to a generally U-shape in the device and thereafter individual clips are cut from the strip by a punch which, in cooperation with a die, applies the clip in encircling relationship to the product. The disclosed prestamped strip facilitates feeding of the same to the clipping operation and the shape of the clip facilitates use of the machine with clips having legs of different lengths.

3,777,401

SAW CHAIN LUBRICATION MEANS

Uwe F. Arff, and Gordon J. Edwards, both of Peterborough, Ontario, Canada, assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Sept. 27, 1971, Ser. No. 183,998
Int. Cl. B27b *17/12*
U.S. Cl. 30—383 17 Claims



Disclosed herein is a chain saw cutter bar including two side plates having respective inside surfaces defining therebetween a groove adapted for receiving the tangs of a saw chain, together with means in one of the side plates defining a lubrication hole communicating with an oil supply conduit in a supporting chain saw powerhead and including a merging surface which extends in the general direction of intended chain travel and relative to the inside surface of the one side plate at an obtuse angle, whereby to discourage sawdust accumulation in the lubrication hole while affording lubricant flow to the saw chain.

3,777,402

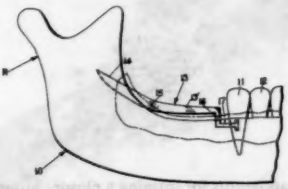
DENTURE SUPPORT FRAME WITH RAMUS IMPLANT FOR MOLAR AREA OF LOWER JAW

Harold Devere Roberts, 217 N.E. Knott St., Portland, Oreg.

Filed Sept. 11, 1972, Ser. No. 287,817
Int. Cl. A61c *13/00*
U.S. Cl. 32—10 A 2 Claims

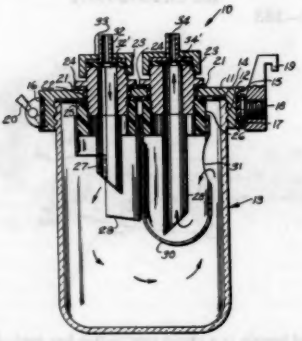
A permanent frame for removably supporting an artificial denture in a molar area of the lower jaw, when there is a sound

natural bicuspid or cuspid tooth adjoining that area, comprising a rigid bar with the rear end formed into a ramus implant, the exposed portion of the bar sized and shaped to conform to the molar area in question extending forwardly spaced a slight distance above the epithelium in that molar area, the forward end of the bar turning first downwardly near the first natural



tooth and extending down into the top of the mandible bone, and finally turning forwardly and extending into a slit in the root of the tooth and anchored therein. When the bar is in place the exposed portion of the bar enables a denture to be firmly but removably set down over the bar in the desired molar area.

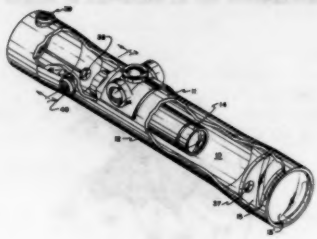
3,777,403
DENTAL SILVER RETRIEVAL APPARATUS
John K. Ritchi-, 1118 Grand St., Alameda, Calif.
Filed Sept. 18, 1972, Ser. No. 290,103
Int. Cl. A61c *17/04*
U.S. Cl. 32—33 **4 Claims**



A device for collecting dental silver. This device consists primarily of a mounting member carrying a sump, a sediment director member, a sediment barrier member and sleeve and tube members which incorporate fittings for hoses.

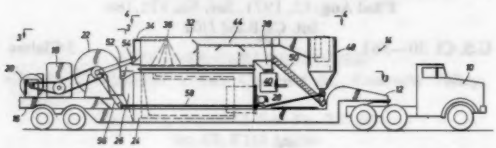
3,777,404
GUNSIGHT ALIGNMENT APPARATUS
Richard A. Oreck, 3206 Plant Dr., Boise, Idaho
Filed Nov. 10, 1971, Ser. No. 198,030
Int. Cl. F41g *1/38, 1/42;* F41a *1/54*
U.S. Cl. 33—245 **3 Claims**

The collimator of the present invention is intended to be carried within a telescopic gunsight. The collimator of this invention comprises an eyepiece reticle suitably disposed from the eyepiece of the gunsight, a forward reticle disposed distally forwardly of the reticle erector of the gunsight and means for horizontally and vertically adjusting the relationship of the eyepiece reticle and the forward reticle. The horizontal and vertical adjusting means include a horizontal set-screw-type adjusting means carrying the eyepiece reticle, and a verti-



cal adjusting means carrying the forward reticle. A further embodiment of this invention includes an eyepiece reticle etched onto the eyepiece of a gunsight and a forward reticle having both horizontal and vertical adjusting means.

3,777,405
DRILLING MUD RECLAIMING APPARATUS
Thomas B. Crawford, Box L, Simonton, Tex.
Filed Apr. 17, 1972, Ser. No. 244,625
Int. Cl. F26b *17/10*
U.S. Cl. 34—57 R **8 Claims**

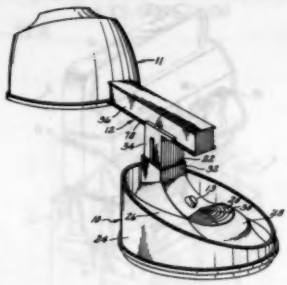


An apparatus for reclaiming drilling mud from a drilling site which incorporates a movable vehicle which carries a forced air furnace which heats a substantial amount of air to an elevated temperature. A fluidized bed dryer is arranged so that hot air passes through the fluid bed heating the bed. The drilling mud is delivered through a suitable pump to a spray system above the bed and is sprayed on the bed. This drives off the water in the drilling mud. The drilling mud is withdrawn from one end of the fluid bed through a sacking mechanism and is bagged. The air flowing from the fluid bed is withdrawn and forced through a cyclone centrifuge, dropping out the dust and the air and water vapor are vented to atmosphere.

3,777,406
HAIR DRYER
Esko J. Nopanen, Asheboro, N.C., assignor to General Electric Company, Bridgeport, Conn.
Filed Dec. 14, 1972, Ser. No. 315,159
Int. Cl. A45d *20/24*
U.S. Cl. 34—99 **9 Claims**

A hair dryer that may be closed for carrying and erected for operation, including a base assembly, a hood assembly to be positioned about the head of the user for distributing heated air to the head and a strut assembly for supporting the rigid hood assembly elevated from the base assembly. The strut assembly has one section thereof secured to the base assembly and a second section having means at one end for coupling

and uncoupling the hood assembly. One of the sections has an incline cooperating with the other section whereby movement of the other section up the incline, raises the hood to an opera-



tive position elevated relative to the base assembly and down the incline to close the hood upon the base for carrying and storage.

3,777,407

CONVEYING- AND DRYING-APPARATUS FOR CERAMIC MEMBERS

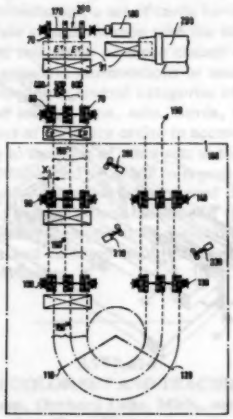
Manfred Leisenberg, Alterwall 3, 775 Konstanz/Bodensee, Germany

Filed Feb. 25, 1972, Ser. No. 229,292

Claims priority, application Germany, Feb. 25, 1971, P 21 09 071.1; Apr. 27, 1971, P 21 20 540.3

Int. Cl. F26b *25/00*

U.S. Cl. 34—105 **8 Claims**



A conveying- and drying-apparatus for ceramic starting members, being transferred after pressing in a drying oven, comprises a drying oven, and a plurality of units disposed behind each other and about laterally set-off. Each of the units includes at least two parallel cable-paths endlessly guided over guide pulleys. The cable-paths serve as a conveying-device from a press to a drying oven and to a pile station. A plurality of blowers is disposed in the drying oven for blowing in different directions. The blowers comprise nozzle blowers and are disposed alternately at least at both sides of the paths at a distance in moving direction, and the distance corresponds with at least the double distance of the successive starting members.

3,777,408

INSTALLATIONS FOR THE TREATMENT, IN GASEOUS MEDIUM, OF A STRIP PRODUCT

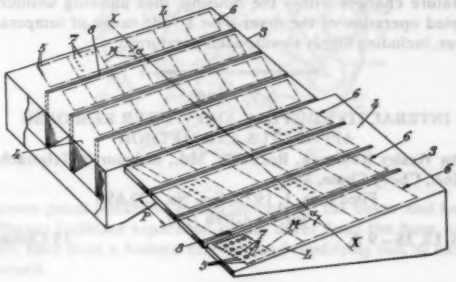
Paul-Henri Marchal, Neuilly-sur-Seine, France, assignor to Air-Industrie, Courbevoie, France

Filed July 23, 1971, Ser. No. 165,494

Claims priority, application France, Aug. 10, 1970, 7029454

Int. Cl. F26b *13/00*

U.S. Cl. 34—156 **9 Claims**



The band of product moves through a treatment zone facing blower caissons. The blower walls of the caissons include apertures distributed according to a succession of contours and along middle lines joining the two large sides of each contour, transverse passages being arranged between each contour. The small side of the contour is greater than half the pitch by which the groups of blower apertures are distributed. The sum of the sections of the outlet passages is greater than the sum of the sections of the blower apertures and inlet apertures.

3,777,409

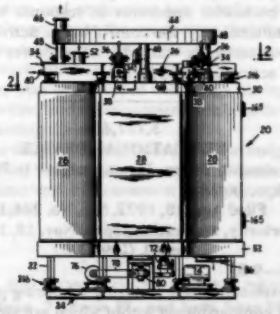
NONDUSTING, HIGH TEMPERATURE DRYER

Edward B. Weisselberg, Old Tappan; George M. Worden, Sr., Park Ridge; William F. Lamp, Closter, and Alexander M. Lane, Allendale, all of, assignors to Wyssmont Company, Inc., Fort Lee, N.J.

Division of Ser. No. 8,985, Feb. 5, 1970, Pat. No. 3,681,855. This application May 5, 1972, Ser. No. 250,621

Int. Cl. F26b *17/12*

U.S. Cl. 34—173 **13 Claims**



Apparatus and method for low dust level drying of material in continuous drying apparatus of the type utilizing a plurality of vertically superimposed, rotating trays to convey the material through the dryer. Billowing of the material, and

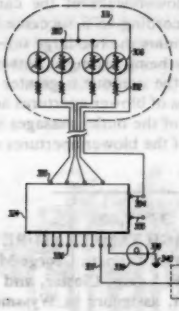
hence dust formation, is retarded by delivering the material to the dryer, and thereafter transferring it between vertically adjacent trays, through inclined chutes. Upon each revolution of the trays, wiper arms guide the material on each tray over the edge of the tray, while other wiper leveler and leverler arms distribute the material discharged on to each tray from the next higher tray over the surface of the tray. All side and both end walls of the dryer housing are thermally insulated to maintain high drying temperatures, and the skeletal support structure, as well as the trays and end walls of the housing, are constructed to expand or contract laterally in response to temperature changes within the housing, thus allowing uninterrupted operation of the dryer over a wide range of temperatures, including highly elevated temperatures.

3,777,410

INTERACTIVE DISPLAY AND VIEWER RESPONSE APPARATUS AND METHOD

John Wesley Robinson, Rockville, Md., assignor to Telattach, Inc., Chevy Chase, Md.

Filed Mar. 1, 1972, Ser. No. 230,698
Int. Cl. G09b 7/02
U.S. Cl. 35—9 B **15 Claims**



An interactive display and viewer response method utilizing several types of apparatus. A program image and a control image are displayed on a screen, the program image being addressable by the viewer who may either remain inactive or activate the particular apparatus in response to the program image. Simultaneously, the control image activates a photooptical readout assembly with which the viewer interacts by instituting in action in the apparatus.

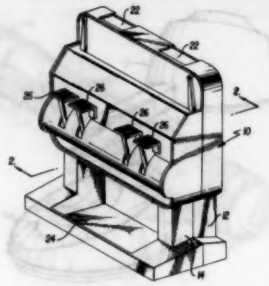
3,777,411

EDUCATIONAL DEVICE

Teruo Matsumoto, Tokyo, Japan, assignor to Epoch Company Ltd., Tokyo, Japan

Filed Apr. 18, 1972, Ser. No. 245,114
Claims priority, application Japan, Nov. 15, 1971, 46/91236
Int. Cl. G09b 3/02
U.S. Cl. 35—9 R **5 Claims**

An educational device featuring a housing provided with a plurality of compartments within which are stored marbles, a receptacle for receiving marbles discharged from the compartments, a slot within the housing into which a series of cards are deposited, each of the cards being provided with indicia designating a problem to be solved and multiple answers thereto; a plurality of operating members corresponding to the multiple answers and mounted to the casing for selectively moving a marble from each storage compartment to a position from which it may drop into the receptacle, each of the cards additionally being provided with a coded answer to the problem permitting a marble to drop into the receptacle only as the operating member corresponding to the correct answer is actuated.

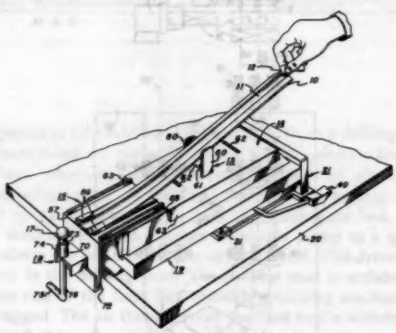


3,777,412

EDUCATIONAL DEVICE

John E. Lawlor, Tappan, N.Y., and John Sgombick, Ramsey, N.J., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 22, 1972, Ser. No. 308,866
Int. Cl. G09b 23/10
U.S. Cl. 35—19 R **7 Claims**



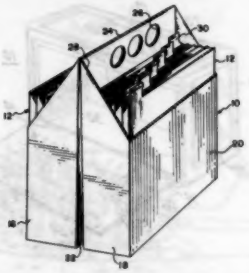
A simple, durable, inexpensive educational device for demonstrating the physical properties of falling objects and collisions especially adapted for use by educational institutions below the college level is described. The device comprises a flexible ruler including channel means for guiding movement of a spherical object and an elongated support member. A vertical support means is releasably secured to the support member and supports the ruler at one end portion thereof in an elevated position. A holding means holds the ruler at the opposite end portion thereof. The device further includes a support means for supporting a spherical object and a sleeve means for containing the support means in slidable relationship thereto.

3,777,413

PERSONAL SENSITIVITY TEST METHOD AND APPARATUS THEREFOR

John T. Zaccheo, Glenview, Ill.

Filed July 10, 1972, Ser. No. 270,000
Int. Cl. G09b 19/00
U.S. Cl. 35—22 R 24 Claims



A method for the systematic investigation of mental phenomena and skills associated with consciousness, behavior, emotions, traits and reactions to stimuli is disclosed which includes the steps of conveying one or more word messages by oral or visual means, associating the message with an identifying indicia and comparing the matches and mismatches of indicia as an indication of the sensitivity or lack thereof to the mental stimuli. The apparatus used to conduct the testing, which can be a serious psychiatric analysis and psychological investigation or a humorous and fascinating parlor game participated in by two or more individuals, comprises, in one embodiment, a set of cards having a plurality of sets of word phrase stimuli thereon with the stimuli of any one set being divided into three or more classes of conservative, moderate and aggressive connotations or meanings. The sets of cards are divided into several categories of human expression relating the senses, time, acts, words, mood, etc. The stimuli on each set of cards are coded in accordance with their class or contrary to the class of other sets so that no preceptive pattern can be established from use in repeated tests or plays and auxillary means are provided to record the results, score the players and arrive at a final measure of the personal sensitivity, compatibility, analytic skills, psychological reactions, superficial traits and outward manifestations of behavior of one or more participants.

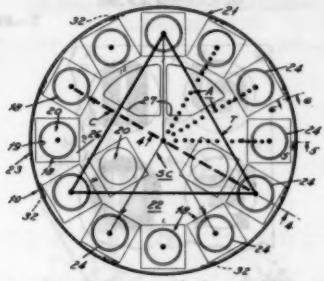
3,777,414

WATER COLOR SET AND TEACHING AID

Edgar A. Robinson, Orchard Lake, Mich., assignor to Palmer Paint Products, Inc., Troy, Mich.

Filed Mar. 1, 1972, Ser. No. 230,655
Int. Cl. G09b 11/10
U.S. Cl. 35—28.5 3 Claims

A circular semi-rigid plastic base is molded to provide a horizontal, cylindrically bottom-flanged panel having an annular series of equally spaced circular, hollow well cavities or indentations, each removably receiving a shallow-walled, telescopingly mated plastic pigment-containing pot. The pots are side-flanged for ready manual grasping in their removal from and replacement in the respective indentations. A snap-on type cover of a clear, semi-rigid plastic has a top circular panel and a cylindrical depending flange nesting over the flange of the base; and the cover is thus flange-guided for manual rotation upon the base. This permits a user to effect optional angularly adjusted relationships of certain opaque reference and selector indicia, as inscribed on the transparent cover panel, to color pots viewed in juxtaposition beneath a



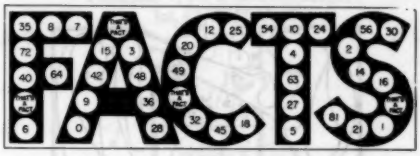
cover panel indicium. Radial indents on the cover and base flanges facilitate separation of the cover from the base, and the base from a bottom finishing and rigidifying disc of cardboard.

3,777,415

GAME FOR LEARNING CORRELATED FACTS

Harold L. Gariety, 4295 E. Mexico, Denver; Carol J. Maloney, and George F. Maloney, both of 1624 S. Yukon Ct., Lakewood, all of Colo.

Filed Oct. 19, 1972, Ser. No. 299,013
Int. Cl. G09b 1/04
U.S. Cl. 35—31 F 10 Claims



A game for learning multiplication and division comprising a set of game boards, one for a caller and one for each player, with numbers thereon, blank chips for the players for covering such numbers, chips for the caller having numbers thereon to be multiplied and also their product. The caller picks one of his chips at random and announces two numbers to be multiplied and the players cover the product on their boards with a blank chip, this continuing until a player covers a predetermined group of such numbers on his board.

The caller may also be provided with chips having numbers thereon to be divided and their quotient, the boards remaining the same, for learning division.

By varying the insignia on the board and the insignia on the caller's chips other similar games may be played. Fractions, state capitals, time and measurement, addition and subtraction, may be learned.

3,777,416

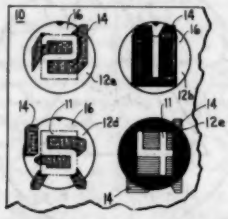
SYMBOL RECOGNITION TEACHING DEVICE

James Paul Milligan, 7 Teresa Pl., and Judy Anne Milligan, 91 Saint John, S. Parkside, both of Buffalo, N.Y.

Continuation-in-part of Ser. No. 185,334, Sept. 30, 1971, abandoned. This application June 23, 1972, Ser. No. 283,083
Int. Cl. G09b 19/02, 1/06
U.S. Cl. 35—31 C 7 Claims

A device for teaching symbol recognition includes a plurality of sets of shaped configurations forming a partial outline

but camouflaging a symbol having a value equal to the number of elements in or representing objects displayed by the set of configurations. The numeral "2," for example, is inherent in and partially outlined by a set of configurations having two



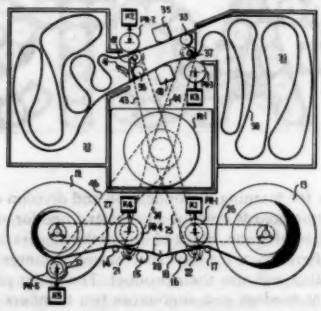
elements. A masking card when superimposed upon the set of configurations together with exposed or unmasked portions of the elements of the set instantaneously forms an outline and background to display the symbol.

3,777,417

SOUND TEACHER

John H. MacNeill, Indialantic; James E. Bellinger, Melbourne; Harrison B. Lidkea, Satellite Beach, and Kenneth L. Seib, Indian Harbor Beach, all of Fla., assignors to Educational Sound Systems, Inc., Melbourne, Fla.

Filed Apr. 28, 1971, Ser. No. 138,249
Int. Cl. G09b *5/04*; G11b *5/02*
U.S. Cl. 35—35 C **16 Claims**



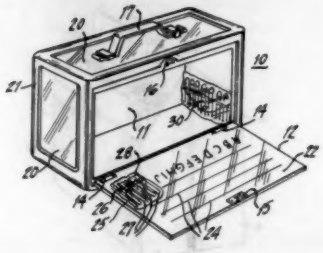
A sound teacher includes a master tape on which individual spaced segments are recorded and a student tape on which a student can record and immediately play back his recording after heating a master tape segment. In one operational mode a selectively actuable pause switch permits the master tape to stop after each master segment is played to permit the student to record or not; in another mode, the master tape stops after a segment, reverses while the student records and listens to his recording, and then replays the master segment and continues on to play the next segment; in still another mode the pause switch causes the master tape to stop after alternate segments to permit the student to record or not. Provision is made for automatically inserting the proper spacing between master tape segments recorded either locally or from some remote location, unintended gaps within a segment being automatically eliminated. In addition, provision is made to permit the student to reverse the master tape through any selected number of master tape segments.

3,777,418

LUNCH BOXES AND SIMILAR DEVICES ADAPTED TO ACCOMMODATE GRAPHIC DATA

Leah H. Cooper, 1653 Sheepshead Bay Rd., Brooklyn, N.Y.

Filed May 12, 1972, Ser. No. 252,702
Int. Cl. B43l *5/00*
U.S. Cl. 35—62 **6 Claims**



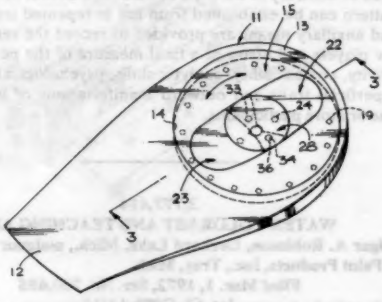
A lunch box or similar apparatus having the exposed outside surfaces thereof laminated with a smooth plastic of the type capable of having applied thereto graphic data by means of a waxy crayon writing tool, which data because of the smoothness of the plastic cover member can be easily removed and reapplied at the desire of the operator.

3,777,419

ADJUSTABLE SHOE INSERT TO REDUCE HEEL SPUR PAIN

Albert L. Nalick, 347 S. Peak Dr., Beverly Hills, Calif.

Filed Dec. 29, 1972, Ser. No. 319,901
Int. Cl. A43b *19/00*; A61f *5/14*
U.S. Cl. 36—71 **4 Claims**



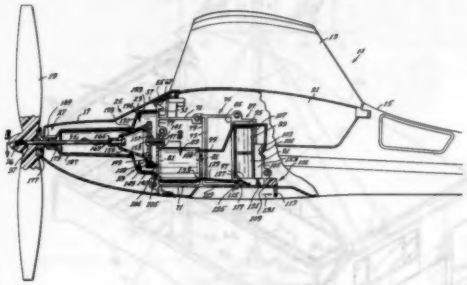
A rigid shoe insert device having means for adjusting the position and shape of a depression in the top surface of the device, to thereby locate the position of a heel spur on the wearer's heel, and hence to provide means to relieve the pressure of the spur on the flesh adjacent the spur by fixing the location of a depression in the surface of the insert to correspond to the shape and position of a spur on the underside of the heel bone.

3,777,420

DETACHABLE POWER MODULE FOR FLYING TOY AIRCRAFT

Denis V. Bosley, Palos Verdes Peninsula, and Richard S. Chang, Rolling Hills Estates, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Aug. 4, 1972, Ser. No. 278,155
Int. Cl. A63h *29/22*
U.S. Cl. 46—243 AV 10 Claims



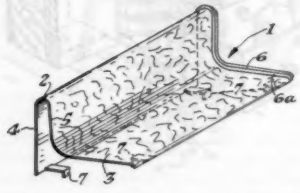
A completely self-contained detachable power module for removable attachment to a vehicle body, such as a flying toy aircraft fuselage, the module including a housing containing a rechargeable battery arrangement and a powerful miniature electric motor coupled through a drive arrangement to a driven element, such as a propeller, the housing also including attachment means for removably attaching the housing to a toy vehicle body.

3,777,421

LAWN BORDER

Joseph A. Bomba, 107 Treemont Rd., Johnstown, Pa., and Andrew J. Bomba, 742 East Dr., Circleville, Pa.

Filed Jan. 26, 1972, Ser. No. 220,858
Int. Cl. A61g *1/00*
U.S. Cl. 47—33 10 Claims



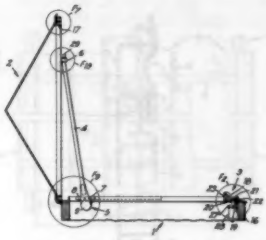
This disclosure relates to a ground dividing edging including lower ground engaging supporting members and upper snap-on capping members having an upstanding retaining wall portion and a substantially horizontal running surface portion for bordering a lawn area from an adjacent ground area.

3,777,422

SKYLIGHT AND SAFETY DEVICE

Leopold Mathieu Lambert Janssen, 28, Rue de l'Ancien Chateau, Herseaux, Belgium

Filed Nov. 22, 1971, Ser. No. 200,889
Int. Cl. E05f *15/20*
U.S. Cl. 49—7 3 Claims



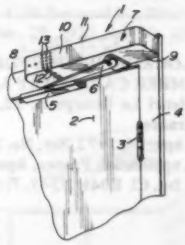
The invention pertains to a skylight having a safety device whereby said skylight is automatically opened in case of excessive heat, said device including spring urged levers and a fusible connection between the latter.

3,777,423

CONDITION RESPONSIVE DOOR HOLDER-CLOSER

Gordon L. Coulter, Arlington Heights, Ill., and Duane D. Pearsall, Morrison, Colo., assignors to Rixson Inc., Franklin Park, Ill.

Filed Jan. 7, 1972, Ser. No. 216,202
Int. Cl. E05f *15/20*
U.S. Cl. 49—31 29 Claims



A surface-mounted door holder-closer responsive to the products of combustion passing through multiple passageways formed in a holder-closer housing cover, a holder-closer assembly frame, and a static shield which is an integral part of an ionization chamber module. The ionization chamber module is insertable into the holder-closer frame with the frame and static shield not only defining the passageways, but also isolating the ion chamber from spurious static charges generated within the housing which would render a false alarm or false emergency door release. The frame also houses the principal components of the holder-closer, namely, a closer spring, a dashpot, a latching lever assembly, and an electromagnet responsive to modulated current flow in the ionization chamber to effect alarm or emergency release of the latching lever to close an otherwise open door. The integrated detector-holder-closer is advantageously and simply mounted on the lintel or header of a door frame.

3,777,424

WEATHER SEAL FOR RAILWAY CAR DOOR

Ernest J. Nagy, Munster, and Ronald W. Marsh, Michigan City, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Oct. 19, 1972, Ser. No. 298,891
Int. Cl. E06b 7/23
U.S. Cl. 49—485 1 Claim

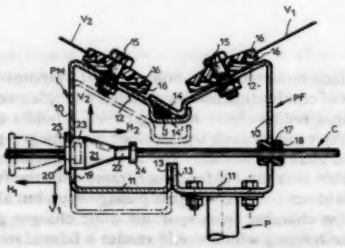
A weather seal for a railway car door is secured to outer peripheral flat edges of the door and is adapted to engage a door frame in sealing relation. The weather seal includes a tubular flexible member which is secured to the peripheral edge of the door by means of fasteners adapted to permit flexing and biasing movement of the tubular member. The fasteners are in turn connected to a peripherally extending flange of a relatively hard material such as metal, hard plastic, etc., having a flat surface which engages the peripheral flange of a door opening and against which the flat strip is compressed in sealing relation when the door is closed.

3,777,425

RELEASABLE LOCKING DEVICE FOR IMMOBILIZING A MEMBER CARRIED BY A CABLE

Andre Edouard Henri Le Bourgeois, 12, rue du Grenier St. Lazare, Paris, France

Filed Apr. 24, 1972, Ser. No. 246,724
Claims priority, application France, Apr. 30, 1971, 7115619
Int. Cl. E04b 1/345, 7/14
U.S. Cl. 52—2 16 Claims



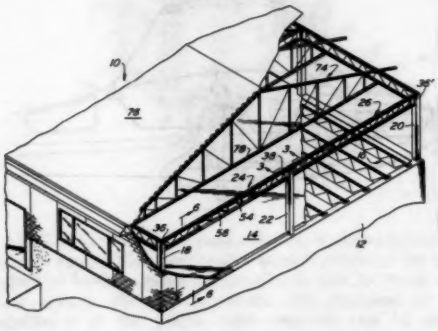
A releasable locking device for separable interconnection of the adjacent edges of two veils V_1, V_2 comprises a stationary section-bar PF carried by a post P and a movable section-bar PM carried by a horizontal driving cable C provided with a wedge-block 20 extending through an opening 19 of the web of the bar. Abutment means 13, 13' and vertically releasable locking means 14, 14' are formed by the confronting lower and upper flanges of the bars, respectively.

3,777,426

BUILDING

Gershen Weiner, 1125 N. 15th St., Allentown, Pa.

Filed June 26, 1972, Ser. No. 266,176
Int. Cl. E04b 1/24
U.S. Cl. 52—92 6 Claims



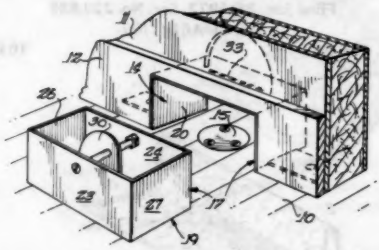
A building is disclosed wherein roof trusses are supported by lintels which in turn are supported at their ends from vertical columns. The lintels support an upper channel and the foundation or footing supports a lower channel. Prefabricated wall panels are retained within the channels.

3,777,427

WALL CONSTRUCTION DEVICE

Raymond Arnold Worley, 600 Checker Dr., Buffalo Grove, Ill.

Filed Sept. 21, 1972, Ser. No. 291,057
Int. Cl. E04f 17/08
U.S. Cl. 52—127 9 Claims



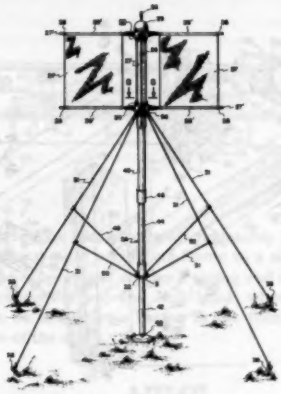
An access device is provided for plugging openings formed in walls or like structures which lead to utility connection points. The access device includes a housing mounted within the wall and defining the perimeter of the wall opening, and a plug box having two plates which can be locked in positions coplanar with the surrounding wall surfaces. The plate locking device comprises a tongue carried by the plug box which can be rotated into locking engagement with a slot formed in the housing.

3,777,428

OBSERVATION SIGNAL DEVICE AND COMPONENTS THEREOF

Edward C. Caufield, 9695 S. 2585 East, Sandy, Utah

Filed Apr. 19, 1972, Ser. No. 245,475
Int. Cl. E01f 9/01
U.S. Cl. 52—146 10 Claims



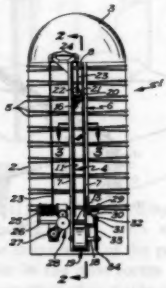
Signal apparatus for use in geodetic surveys, land surveys, emergency use, and so forth. The signal apparatus comprises a panel signal wherein panels incorporated therein are constructed to facilitate wind-spillage in a manner such as to preclude the panel signal structure from tipping or blowing over upon the presence of excessive wind pressures. The panel structure is lightweight, a self-contained unit, and includes, preferably, flexible arm mounts constructed to mount signal panels in such a manner that these panels can "spill" or pass oncoming gusts of wind without chancing the blowing over of the structure.

3,777,429

SILO DOOR CONSTRUCTION

Robert F. Koser, Almena, Wis.

Filed Aug. 28, 1972, Ser. No. 284,365
Int. Cl. E04h 7/22
U.S. Cl. 52—196 2 Claims



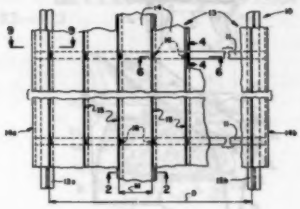
A frame adapted to be mounted in a door opening in a silo wall, the opening extending for the greater part of the height of the silo wall, the frame including side members defining opposed guide elements. An elongated flexible door is movable in the guide elements longitudinally of the silo wall opening between open and closed positions, and means is provided for imparting opening and closing movements to the door.

3,777,430

COMPLEMENTARY MATING ELEMENTS FOR DOUBLE-SKIN FOAM CORE PANEL

Walter Tischuk, Richmond, Ind., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Aug. 30, 1972, Ser. No. 285,060
Int. Cl. E04c 1/10, 2/20
U.S. Cl. 52—309 6 Claims



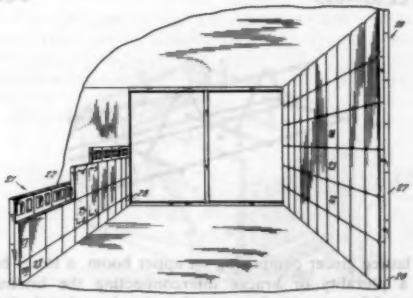
A double-skin building construction panel having a foam core and having an outer facing sheet laterally offset from and spaced apart from an inner facing sheet. Each panel presents an overlapping edge portion along one side and an overlapped edge portion along its opposite side. The panels are adapted to be assembled in lapped relation without externally visible fasteners. Mating elements in the outer facing sheets provide a positive mechanical connection of adjacent outer facing sheets and provide for lateral adjustment in the position each panel relative to the previously erected panel. The arrangement is such that during erection, the panels may be gathered or spread apart to conform the coverage provided by all of the panels with that required by the structural framework.

3,777,431

ERECTABLE AND DISASSEMBLABLE PARTITION AND PANEL THEREFOR

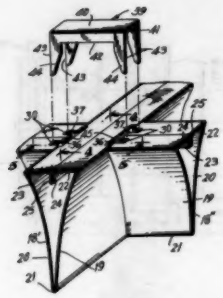
Theodore Bowman, 4734 Baynard St., Pittsburgh, Pa.

Filed Mar. 29, 1972, Ser. No. 239,224
Int. Cl. E04c 1/10
U.S. Cl. 52—562 10 Claims



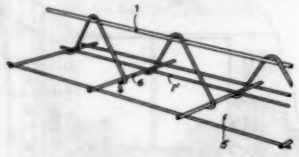
A readily assemblable and disassemblable wall or partition, consisting of a plurality of smooth faced rectangular panels, each providing interlocking elements at the rear thereof so that the smooth faces on each set of panels will together form one side of the partition and the interlocking faces of the panels will integrate both sides of the partition. The interlocking panels are so arranged that each panel interlocks four adjacent quadrants of four adjacent panels on the opposite side. The interlocking elements comprise projections and recesses.

3,777,432
COLLAPSIBLY JOINED LOUVER GRID
Walter E. Wyles, Somerset, N.J., assignor to Lightolier Incorporated, Jersey City, N.J.
Filed Sept. 18, 1972, Ser. No. 289,851
Int. Cl. E04c 2/42; E04f 15/06
U.S. Cl. 52—668 6 Claims



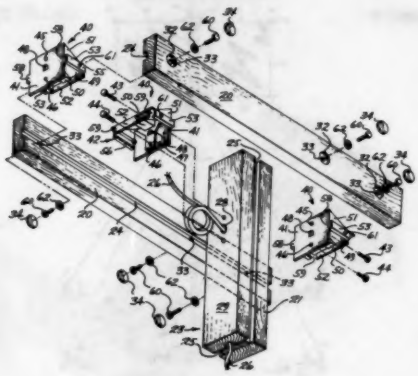
A lighting fixture having an improved louver grid is disclosed wherein the various fins or louvers are integreated into a grid in such a manner that the louvers, at the intersections, are mutually rigidifying and are interconnected by integral spring flanges or tabs. The louvers maybe readily assembled into the grid configuration without the use of tools or external fasteners of any nature, and may be readily disassembled for repair or replacement.

3,777,433
LATTICE GIRDER
Fritz Grebner, Annabergstr. 70, Mainz/Rh; Wilhelm Kolsch, Robert Kochstr. 16; Gerhard Spindler, Brunhildenstr. 14, both of Wiesbaden, and Walter Ehemann, Waldstr. 127, Nauheim, all of Germany
Division of Ser. No. 69,087, Sept. 2, 1970, abandoned. This application Mar. 8, 1972, Ser. No. 232,981
Claims priority, application Germany, Sept. 3, 1969, P 19 44 626.5; Mar. 6, 1970, P 20 10 666.5
Int. Cl. E04c 3/09
U.S. Cl. 52—693 4 Claims



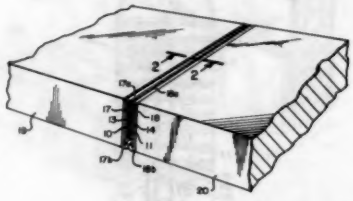
A lattice girder comprising an upper boom, a lower boom and a plurality of braces interconnecting the booms, is produced from a grid of structural steel rods so that the braces extend in parallel planes oblique to perpendicular planes passing through the booms, the rods being spot welded at their points of intersection. The longitudinally and transversely extending rods of the grid are fed to a spot welding station in adjacent parallel planes so that the transversely extending rods extend obliquely to the longitudinally extending rods. The grid is then cut into longitudinally extending sections each forming a girder blank, and each section is bent about a longitudinally extending axis to produce the lattice girder, one of the longitudinally extending girders forming the upper boom and the transversely extending rods forming the braces.

3,777,434
CONNECTOR
Robert W. Selden, and Edward W. Schein, both of Seattle, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.
Filed Apr. 26, 1971, Ser. No. 137,382
Int. Cl. F16b 7/04
U.S. Cl. 52—753 C 7 Claims



A means for attaching one member to another to prevent racking or twisting of the members. It includes a connector which attaches to one member and has a key which fits into a groove in the other member. Several modifications are shown. In one the connector clamps to the first member. In another, both members have grooves which are angularly displaced and the connector has keys which fit into both grooves. A light standard is illustrated. The groove is in the horizontal crossarm and is used to conceal the wire from the pole to the luminaire. The key may be channel-shaped to provide access into the groove for the wire.

3,777,435
ATTACHMENT ASSEMBLY
Joseph Perina, Huntington, N.Y., assignor to American Velcro Inc., New York, N.Y.
Filed Nov. 15, 1971, Ser. No. 198,657
Int. Cl. F16b 5/07
U.S. Cl. 287—20.924 6 Claims

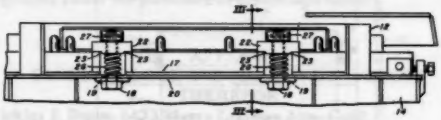


An attachment assembly for releasably joining panels or partitions along their edges is disclosed which comprises two channel members each being secured along the edge portions of the panels to be joined. Separable fastening members are secured in each channel member in a manner permitting the fastening members to slide along each channel member. The panels or partitions are secured together by engagement of the fastening members on each channel member.

3,777,436
QUICK RELEASE MECHANISM FOR CONTINUOUS CASTING MOLD SUPPORT FRAME

Charles H. Bode, Jr., Upper St. Clair Township, Allegheny, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed July 30, 1971, Ser. No. 167,723
Int. Cl. F16b *5/06*
U.S. Cl. 52—758 C **8 Claims**

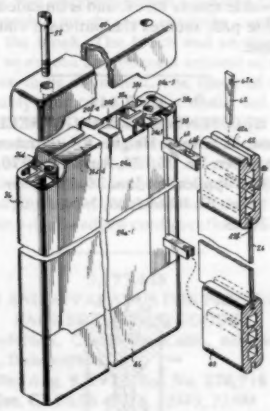


A quick release mechanism for releasably attaching a continuous casting mold oscillating frame to a support. A bolt is fixed to the support and carries a spring and rotatable anchor block between the nut and bolt head, whereby the anchor block can be seated in a recess in the frame by a minimal movement of the nut.

3,777,437
PANEL AND POST ASSEMBLY

Andreas Christen, Zurich, Switzerland, assignor to Knoll International, Inc., New York, N.Y.

Filed May 28, 1971, Ser. No. 147,829
Int. Cl. F16b *5/00*
U.S. Cl. 52—758 **7 Claims**

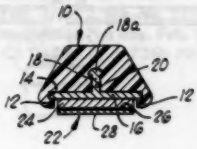


A sheet-like panel is held in place by a post. The post has a longitudinal internal channel, with a longitudinal opening through one of the outer walls of the post into the channel. A longitudinal groove in the post forms a part of the channel, and the groove is positioned in a side of the channel opposite from the longitudinal opening and laterally displaced from that opening. The sheet-like panel has a large area surface that terminates along one edge thereof in a first edge portion which is substantially at right angles to the large area surface and a second edge portion substantially parallel to that surface. The outer edge of the second edge portion constitutes one of the outer edges of the sheet-like panel and is positioned inside the longitudinal groove forming part of the longitudinal internal channel. One side of the first edge portion is positioned against an outwardly exposed part of the post. The other side of the first edge portion is positioned against an internal wall of the channel substantially opposite from the longitudinal groove. In this fashion the sheet-like panel is maintained firmly in position.

3,777,438
ORNAMENTAL PROTECTIVE RAIL

Russell L. Brown, 1620 Kingsbury Ln., Oklahoma City, Okla.

Filed Aug. 30, 1971, Ser. No. 176,113
Int. Cl. E04f *19/02*; **B60r** *13/04*
U.S. Cl. 52—173 **1 Claim**

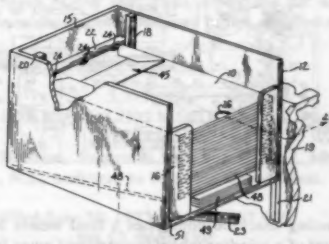


An ornamental protective rail including an elongated strip of elastomeric flexible material having a pair of inwardly turned retainer toes adjacent the side edges thereof along a bottom portion of the elongated strip, and further having, in a preferred embodiment, a slot extending from the central portion of the bottom of the strip interiorly of the strip. A rigid strengthening and reinforcing member is retained in a longitudinally extending channel formed by the toes, and preferably carries a flange projecting normal to the retaining strip into the slot formed in the elastomeric strip. A strip of compressible material is bonded to the rigid reinforcing strip along one side of the strip of compressible material and has an adhesive material on the opposite side of the strip of compressible material.

3,777,439
BAG-OPENING DISPENSER AND METHOD

Sidney Fried, Ridgefield, Conn., assignor to Speedcheck Systems, Inc., Ridgefield Park, N.J.

Filed June 21, 1971, Ser. No. 154,893
Int. Cl. B65b *43/26*
U.S. Cl. 53—3 **8 Claims**

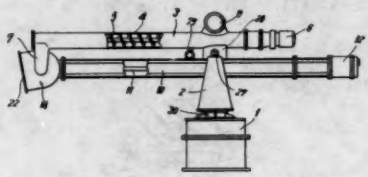


Merchandise bags such as grocery bags are stored in a container horizontally, with the folded-over bottom of the bag facing upwardly. The front edge of the upper wall of the bag is gripped and pulled longitudinally and upwardly while the bottom edge of the bag is held by a weighted bar. The bar holds the bag until it has been pulled open. Then, the continued pull on the bag slides it out from under the bar and out of the container. The bag is open and ready to be packed full of merchandise by the check-out cashier or bagging employee.

3,777,440
ABRASIVE SLINGING APPARATUS

Akira Yamanoto; Dan Yoshida; Tatsumi Onaka, and Minoru Shiraishi, all of Osaka, Japan, assignors to Hitachi Shipbuilding and Engineering Company Ltd., Osaka, Japan

Filed June 27, 1972, Ser. No. 266,693
Claims priority, application Japan, June 30, 1971, 46/57168
Int. Cl. B24c *3/06, 7/00, 3/32*
U.S. Cl. 51—9 9 Claims

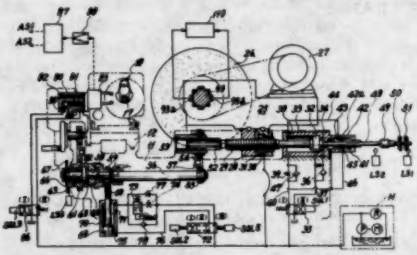


Apparatus for abrasively treating relatively large areas such as the removal of rust in shipyard operations, consists of an abrasive slinging head mounted at one end of an abrasive supply conveyor which is pivoted on a horizontal axis to a turntable moveable around a vertical axis, the conveyor serving as a boom for the head and being relatively balanced on the turntable. A driving arrangement imparts oscillating motion to the conveyor and slinging head in either horizontal or vertical directions, or both, and enables the centerline of oscillation of the motion in either direction to be positioned as desired.

3,777,441
GRINDING MACHINE

Mikishi Kurimoto, Nagoya, and Hiroaki Asano, Chiryu, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed June 2, 1972, Ser. No. 259,133
Claims priority, application Japan, June 3, 1971, 46/38926
Int. Cl. B24b *5/42*
U.S. Cl. 51—105 SP 9 Claims

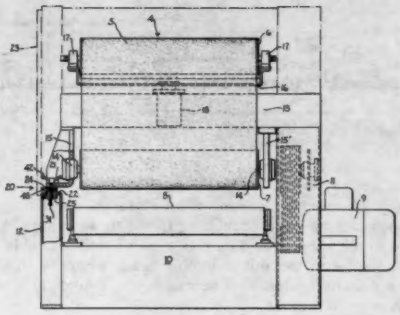


A grinding machine comprises a feed means for effecting movement of a grinding wheel towards and away from a workpiece. A sizing device generates a sizing signal in response to the diameter of the workpiece for stopping the feed movement at an appropriate time in order to effect a spark out operation. A detector detects the grinding resistance applied on the grinding wheel. A timer is energized during the movement of the grinding wheel towards the workpiece and is timed out after a predetermined time period. If the grinding resistance becomes substantially of a zero value before the timer is timed out, then the grinding wheel is caused to be retracted from the workpiece and a succeeding grinding operation is rendered operative.

3,777,442
WIDE BELT SANDING MACHINE WITH IMPROVED SUPPORT FOR OUTBOARD END OF CANTILEVERED CENTER BAR

John M. Bernu, Minneapolis, Minn., assignor to Timesavers, Inc., Minneapolis, Minn.

Filed Apr. 3, 1972, Ser. No. 240,683
Int. Cl. B24b *21/00*
U.S. Cl. 51—135 R 8 Claims

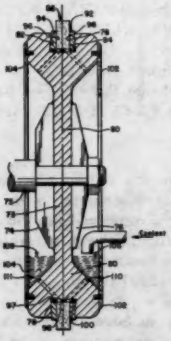


A sanding machine has a wide endless abrasive belt trained around a contact drum and a tensioning roll, both journaled in bearings mounted on a cantilevered center bar. The outboard end of the center bar is rigidly supported by a spacer block removably inserted between the underside of a foot-like bracket depending from the outboard end of the center bar and the top surface of a pad vertically adjustably mounted on the frame of the machine beneath the bracket. A clamping screw that passes freely through aligned holes in the bracket and the removable spacer block, and is threaded into the vertically adjustable pad, secures the outboard end of the center bar to the frame.

3,777,443
SEGMENTED GRIDING WHEEL

Milton C. Shaw, 132 Maple Heights Rd., Pittsburgh, Pa.

Division of Ser. No. 28,721, April 15, 1970, Pat. No. 3,636,665. This application Jan. 24, 1972, Ser. No. 220,521
Int. Cl. B24d *5/06, 5/10, 55/02*
U.S. Cl. 51—206.5 4 Claims



A segmented grinding wheel assembly particularly suited for high speed operation. The disclosed embodiments comprise wheel members having an outer peripheral recess in

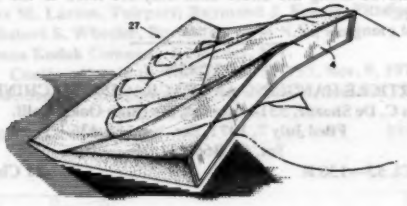
which grinding segments are positioned to define the grinding or working portion of the assembly. The recess and segments are related so that the segments are held in the recess by compressive reaction forces produced during wheel rotation. Additionally, the specification discloses an arrangement particularly adapted for supplying cooling or lubricating fluid to the wheel periphery. The arrangement comprises an inwardly open, circumferentially extending fluid receiving trough carried by the wheel. The trough is connected to the recess by generally radially extending passages such that during wheel rotation fluid moves outwardly to the recess and between the segments under the influence of centrifugal force.

3,777,444

SANDING BLOCK AND ABRASIVE ENVELOPE THEREFOR

Kirkley J. Dunn, 1473 Merry Ln., San Jose, Calif.

Continuation-in-part of Ser. No. 59,377, July 30, 1970, abandoned. This application Jan. 10, 1972, Ser. No. 216,385
Int. Cl. B24d *15/04*
U.S. Cl. 51—391 **6 Claims**



Presented are two embodiments of a sanding block adapted to be inserted within an abrasive envelope configured to fit snugly around the block. The block and envelope assembly are configured to expose an optimum amount of abrasive surface to a surface to be smoothed. The block of one embodiment is preferably fabricated from a dense but flexible and resilient material which permits conformation of the abrasive surface of the assembly to a surface to be abraded, while the block of the second embodiment is preferably wedged, fabricated from a sponge-like material such as sponge rubber or polyurethane foam-type material, and beveled along lateral edges to provide a dual wedged configuration.

3,777,445

METHOD AND APPARATUS FOR PRICING CASE PACKED CANNED GOODS

Richard F. Anderson, Camarillo, Calif., assignor to W. R. Grace & Co., Duncan, S.C.

Filed Aug. 9, 1972, Ser. No. 278,916
Int. Cl. B65b *43/26, 43/40, 21/06*
U.S. Cl. 53—14 **7 Claims**

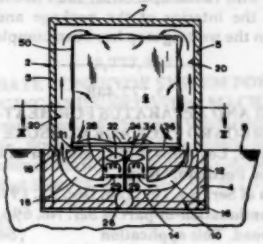
This invention relates to a method and apparatus for pricing, at a central location, canned goods packed in cartons. The method comprises the steps of slitting the cartons so that at least the bottom forms a tray, removing the unused part of the carton, placing the pricing information on the canned goods, and then wrapping the canned goods and tray in sheet material; and, the apparatus comprises means for conveying the cartons of canned goods, means for slitting or cutting the cartons away from the canned goods, means for placing the pricing information on the canned goods, and wrapping means. After wrapping, the priced goods are then ready for distribution to retail grocery stores and supermarkets.

3,777,446

METHOD AND APPARATUS FOR WRAPPING A LOAD WITH HEAT-SHRINKABLE FILM

Odd Graver, Haslum, Norway, assignor to A/S Ingeniorfirmaet Fernholt & Giersten, Sandvika, Sweden

Filed Feb. 7, 1972, Ser. No. 223,997
Claims priority, application Norway, Feb. 10, 1971, 493
Int. Cl. B65b *53/06;* **F26b** *19/00*
U.S. Cl. 53—30 **4 Claims**



Method and apparatus for wrapping a load with heat-shrinkable film comprising the steps of initially providing the load with an open-bottomed envelope of heat-shrinkable film, positioning the load in a shrink tunnel, withdrawing air from the lower open end of the envelope in order to create a subpressure therein and simultaneously withdrawal of air from the tunnel space passing the lower side edges of the load, heat the air withdrawn from the tunnel space and the inside of the envelope, re-circulate the air into the tunnel space towards the top side of the load where the air currents will turn around and move downwards along the outside of the film envelope to the lower side edges of the load from where the air a-new is withdrawn from the tunnel space and fulfills a closed circulation loop.

3,777,447

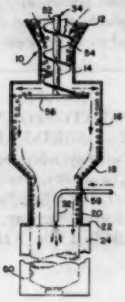
METHOD FOR PACKAGING VISCOUS VINYL PLASTIC SOLUTIONS

Richard H. Herbine, Ziegerville, Pa., and David J. Morrison, Plainfield, N.J., assignors to Schering Corporation, Bloomfield, N.J.

Filed June 30, 1972, Ser. No. 267,905
Int. Cl. B65b *3/08*
U.S. Cl. 53—36 **8 Claims**

A simplified technique well suited for automated, high speed filling of packages with viscous vinyl plastic solutions, such as denture adhesives, which exhibit a (1) viscous taffy-like, sticky consistency and (2) a high degree of uniformity when utilized by the consumer. The first step of the technique requires he introduction of beads of the vinyl polymer into the open end of the package while simultaneously completely wetting each bead with a suitable solvent; a later step requires the aging of the wetted beads within the sealed package until the beads are fully dissolved and form a uniform product. In

the preferred embodiment, the solvent is introduced into the open end of the package by a conduit. In the alternative embodiment, the solvent is injected into the package by an elongated needle with radial apertures, such needle being axially inserted into the interior of the package and being axially removed when the wetting step has been completed.



3,777,448

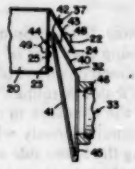
METHOD AND APPARATUS FOR HEAT-SEALING PAPERBOARD PACKAGE CLOSURE FLAPS

William J. Howe, Los Altos, Calif., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Continuation of Ser. No. 101,126, Dec. 23, 1970, abandoned, which is a continuation-in-part of Ser. No. 696,794, Jan. 10, 1968, abandoned. This application , Ser. No. 273,945

Int. Cl. B65b *7/20*

U.S. Cl. 53—47 **19 Claims**



Method and apparatus for heat-sealing paperboard package closure flaps having a heat sealable coating. While the package moves, two flaps are brought into proximity along two planes diverging at an acute angle, and upon the facing flap surfaces, are impinged one or more high-volume, low-velocity streams of very hot air, each along a controlled narrow area to heat one or more critical strips of each flap above the heat-sealing temperature. Immediately thereafter, the flaps are forced together and held together while they are cooled, until the lowering of the temperature results in completion of the seal.

3,777,449

METHOD AND APPARATUS FOR APPLYING CLOSURES TO CONTAINERS

Siegmar Sindermann, Pelkum-Herringen, Germany, assignor to Holstein & Kappert Maschinenfabrik Phonix GmbH, Dortmund, Germany

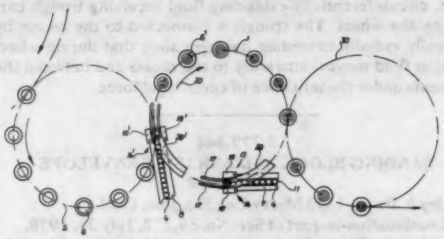
Filed June 5, 1972, Ser. No. 259,969

Claims priority, application Germany, June 3, 1971, P 21 27 425.9

Int. Cl. B65b *7/28*

U.S. Cl. 53—43 **10 Claims**

To seal containers, closure members are supplied along a pair of downwardly curving tracks to a circle of sealing elements which rotate about a vertical axis. The sealing elements travel in a plane inclined obliquely to the vertical axis and the tracks are arranged tangentially to the circle at angularly spaced positions. Closure members move down each track to an associated transfer mechanism which holds individual closure members as they are picked up by the sealing elements and moved along the circle until they are fixed to the containers.



3,777,450

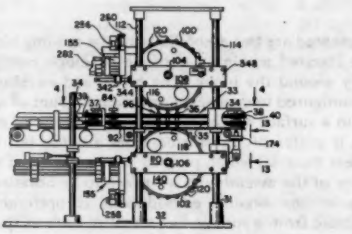
ARTICLE HANDLING AND PACKAGING MACHINE

James C. De Shazor, 3314 Coy Dr., Sherman Oaks, Calif.

Filed July 7, 1971, Ser. No. 160,436

Int. Cl. B65b *21/06*

U.S. Cl. 53—138 R **21 Claims**



The disclosure relates to an article handling and packaging machine particularly adapted for use in supplying packaging clips such as shown in U.S. Pat. No. 3,370,700 to pluralities of containers such as beer cans in order to assemble and connect pluralities of beer cans in unitary packaged groups such as four-packs, six-packs or eight-packs as desired. While the said packaging machine is particularly adapted for use in applying such packaging clips to articles such as cans of beer or the like the machine may be readily adapted for use in applying caps to open containers or for applying labels or indicia on various articles. The disclosure includes endless belt structures provided with rotor engaging surfaces and opposed surfaces having pockets therein adapted to engage articles; drive means on the belts is adapted to cooperate with an applicator rotor which rotates in unison with the linear movement of the belts; said applicator rotor having peripheral portions disposed to roll in to close proximity to articles carried in said pockets of said belt so that said applicator rotor may apply connecting clips to a plurality of articles held in said pockets and moved therein whereby said articles are packaged into a unitary assembly such as a four-pack, six-pack or eight-pack of beverage cans or the like; the disclosure also includes means for coordinating the timing of the various features of the machine so that a plurality of said belts may be adjusted relative to each

other so that their pocket portions are precisely aligned in opposition to each other for engaging opposite sides of articles or containers; the disclosure further including switch operating means on the applicator rotor for timing and initiating operation of a part feeder mechanism adapted to feed packaging clips or other parts from a magazine and to place the parts precisely on peripheral portions of the applicator rotor as it rotates in relation to the magazine; additionally the disclosure includes details of a variety of feed mechanisms for feeding packaging clips as well as other parts from the magazine of the machine on to the applicator rotor of the machine; further the disclosure includes novel mechanisms for driving parts longitudally in contiguous stacked relation to each other in the magazine of the machine for maintaining the parts constantly in a feed relation to the parts feed mechanism which is intermittently operable to place parts, such as packaging clips, on the peripheral portions of the applicator rotor of the machine during its rotation relative to the parts feed mechanism and the magazine.

3,777,451

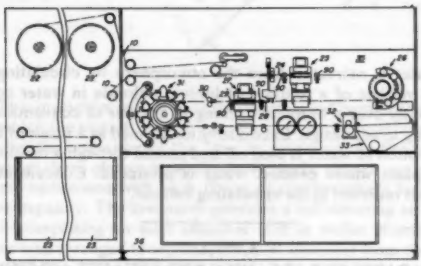
APPARATUS FOR MAKING AND FILLING LIQUID CONTAINING PODS

Lars M. Larson, Fairport; Raymond J. Feasey, Pittsford, and Robert S. Wheeler, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 87,757, Nov. 9, 1970, abandoned. This application July 31, 1972, Ser. No. 276,499

Int. Cl. B65b *9/02, 51/30*

U.S. Cl. 53—180 **19 Claims**



An apparatus for forming and filling liquid containing pods which have a rupturable seal permitting release of the liquid content when the pod is subjected to a predetermined mechanical stress. Strips of laminated material are continuously formed into a plurality of liquid containing pods by advancing the strips, having a width equal to the width of the pods, through heat sealers which seal the edges of the strips to form a tubular structure which is continuously filled with a liquid after which the filled tubular structure is passed through a cross-sealer to form the end seals of the individual pods. The individual pods are chopped from the strip by cutting between the cross seals.

3,777,452

PACKING MACHINE

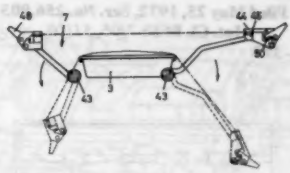
Elisabeth Koenders, Willem Arentszkade 79, Utrecht, Netherlands

Filed May 3, 1971, Ser. No. 139,413

Int. Cl. B65b *11/02, 11/12, 49/08*

U.S. Cl. 51—206 **9 Claims**

A packing machine, especially for packing articles in stretch foil, comprising a feeding device for the article to be packed, a support device on which the article can rest during packing, a foil feeding device for the supply of foil in the proximity of the product to be packed, swivable folding arms with gripping jaws for engaging foil and folding it around the article, means for folding up foil wound around the product, and a discharge



device. The gripping jaws of the folding arms are provided with an elastic diaphragm which can clamp the edge of the stretch foil under the influence of a pressure medium.

3,777,453

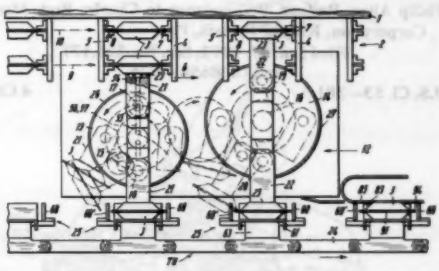
INTERMEDIATE CONVEYOR SYSTEM FOR USE WITH BAGGING AND CARTONING MACHINES

Helmuth Zimmermann, Waiblingen/Wurttemberg, and Helmut Kielwein, Stuttgart, both of Germany, assignors to Fr. Hesser Maschinenfabrik AG, Stuttgart, Germany

Filed Sept. 26, 1972, Ser. No. 292,311

Int. Cl. B65b *7/08*

U.S. Cl. 53—251 **23 Claims**



An intermediate conveyor system which transports filled and closed bags from an intermittently operated conveyor of a bagging machine to a continuously operated conveyor of a cartoning machine. The conveyor of the bagging machine delivers two rows of bags which are located in two vertical planes, and the conveyor of the cartoning machine has a single row of horizontal trough-shaped receptacles. The intermediate conveyor system has a removing unit with two turntables each carrying two pivotable arms having suction heads. The arms of one turntable remove bags from one of the rows and the arms of the other turntable remove bags from the other row. Each freshly removed bag is turned through 180° and is deposited into one of a series of continuously driven containers for transport into a receptacle of the conveyor in the cartoning machine. A rear wall of the each container is movable between an upright position in which it receives a bag and a horizontal position in which it deposits a bag into an empty receptacle. The containers carry and cooperate with tools serving to reduce the dimensions of bags not later than on transfer of bags into the receptacles.

3,777,454

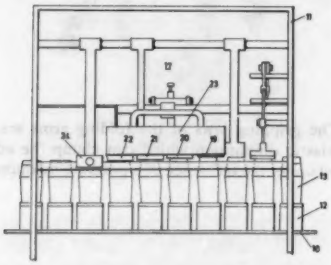
APPARATUS FOR SEALING PLASTIC CONTAINERS

Jacob Teunis Teunissen Van Manen, Johannesburg, South Africa, assignor to Conical Containers Company (Proprietary) Limited

Filed May 25, 1972, Ser. No. 256,903

Int. Cl. B65b *7/06, 51/10*

U.S. Cl. 53—373 **4 Claims**



A method of and apparatus for sealing plastic containers having a pouring spout in which a heating element is moved along the longitudinal axis of the pouring spout to abut the edges of the pouring spout. The edges of all of the layers of material comprising the pouring spout are thus fused together. Ultimately the fused edges are flattened between suitable jaws and trimmed to provide a neat appearance.

3,777,455

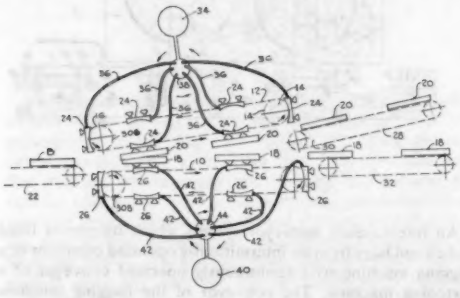
BOX LID REMOVING APPARATUS

Philip Allen, Radnor, Pa., assignor to Charles Beck Machine Corporation, King of Prussia, Pa.

Filed Jan. 27, 1972, Ser. No. 221,177

Int. Cl. B65b *43/26*

U.S. Cl. 53—381 A **4 Claims**



A box lid removing apparatus is herein described including upper and lower chain link, endless conveyors. A plurality of box lid grabbing suction members are mounted on the upper conveyor and a plurality of box base grabbing suction elements are mounted on the lower conveyor. The conveyors are arranged to convey a lidded box along a generally horizontal path. The upper conveyor may be arranged in the VERTICAL plane to diverge from the lower conveyor so that a box lid, held by a suction element on the upper conveyor, is removed from the box base as the box and lid are conveyed along the horizontal path defined between the two conveyors.

In one feature of the invention, flexible conduits connect the suction elements with a source of vacuum through a rotary sequencing valve. One such valve may be associated with the upper conveyor and may be positioned above and generally midway between the opposite ends of the horizontal extension of the upper conveyor. The rotary sequencing valve associated with the lower conveyor may be disposed below and generally midway between the opposite ends of the horizontal extension of the lower conveyor. The conveyors may be supported, from a front portion of the overall assembly, in a cantilevered fashion.

3,777,456

EXTRACTING WATER FROM THE ATMOSPHERE

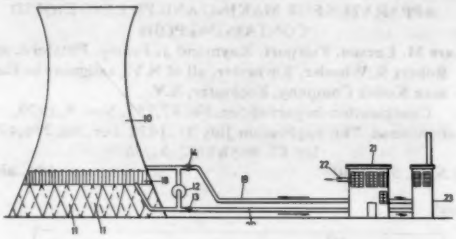
Basil Gilbert Alfred Lund, 6th Floor, Lestar House, 56 Marshall St., Johannesburg, South Africa

Continuation-in-part of Ser. No. 805,047, March 6, 1969, abandoned, which is a continuation of Ser. No. 653,858, July 17, 1967, abandoned. This application Oct. 1, 1971, Ser. No. 185,780

Claims priority, application South Africa, July 22, 1966, 4,346

Int. Cl. B01d *53/14*

U.S. Cl. 55—32 **2 Claims**



Water is extracted from the atmosphere by circulating a large volume of a solution of lithium chloride in water continuously over a Munters packing in a tower of conventional cooling tower design. Excess solution formed as a result of the absorbtion of water is bled off and passed through a desalination plant where product water is produced. Concentrated brine is returned to the circulating volume.

3,777,457

APPARATUS FOR CLEANING THE EXHAUST AIR FROM WORKSHOPS

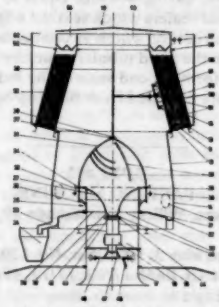
Max Laube, Zurich, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jan. 17, 1972, Ser. No. 218,067

Claims priority, application Switzerland, Jan. 29, 1971, 1375/71

Int. Cl. B01d *50/00*

U.S. Cl. 55—223 **13 Claims**



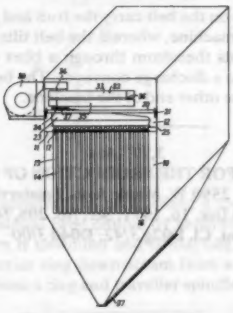
An apparatus for cleaning the exhaust air from workshops, said apparatus comprising a cyclone and a filter attached to

the delivery end of the cyclone, whereby within the cyclone and before a rotary movement of the exhaust air, dusty and/or gaseous constituents of the air are combined with droplets of liquid to increase the action of rotary movement for removal of these constituent from the air and further delivering the air cleaned by rotary action through a wet operated filter removing all remaining constituents from the air.

3,777,458
AIR FILTERS

Geoffrey Roy Dence, Flat 10, 13 Chesham St., London, England

Filed June 18, 1971, Ser. No. 154,439
Claims priority, application Great Britain, Mar. 30, 1971, 8,144/71
Int. Cl. B01d *46/04*
U.S. Cl. 55—287 **2 Claims**



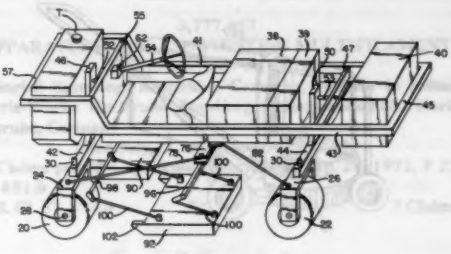
This invention relates to self cleaning air filters of the type in which the operative filter elements are periodically cleaned during the operation of the filter by reversing the flow of air through these elements; and is particularly, though not exclusively concerned with such filters of comparatively large air flow capacity. The invention provides a self cleaning air filter unit comprising an inlet chamber and an outlet chamber, a filter wall arranged to separate the inlet chamber from the outlet chamber, a plurality of filter elements arranged on the filter wall in an array of cross-wise rows over a length of the filter wall to allow air to pass from the inlet chamber to the outlet chamber through the filter elements, a gantry arranged in the outlet chamber across said array for traverse along the length of the array, a plurality of reverse air flow nozzles arranged on the gantry to register successively with the filter elements on each row of the filter elements, and means for supplying air to the nozzles to exit therefrom at such speed that in use of the filter unit the flow of air from the inlet chamber to the outlet chamber is reversed through a filter element when it is in alignment with a nozzle.

3,777,459
MOWING DEVICE

Brantford G. Elliott, Nashville, Tenn., assignor to Harrington Manufacturing Co., Inc., Lewiston, N.C.

Filed July 8, 1971, Ser. No. 160,708
Int. Cl. A01d *35/28*
U.S. Cl. 56—15.3 **19 Claims**

My invention pertains to a mowing device that can easily and continuously operate on slopes as great as 40 degrees without danger of overturning. My mowing device comprises a wheel supported framework and a cradle section supported by said framework so that the cradle section can swing through at least a limited arc with respect to its supporting framework as the mower unit moves from level to sloping ground, to thus

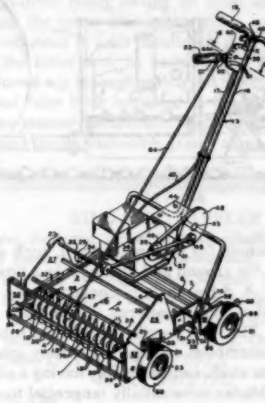


maintain the cradle section in an essentially level attitude at all times. The invention also includes other novel features useful on a mowing device, including steering mechanism, etc.

3,777,460
LAWN CONDITIONING MACHINE

Frank Mokros, 223 New York Ave., North Bay Shore, N.Y.

Division of Ser. No. 642,884, June 1, 1967, abandoned. This application Dec. 17, 1969, Ser. No. 886,050
Int. Cl. A01d *51/00*
U.S. Cl. 56—16.7 **12 Claims**



A lawn conditioning machine comprising grass raking tines. The raking action is a natural reciprocal movement during which foreign material is made free and gathered. The rake is angularly and height adjustable to vary the depth of raking action. The tines are removably supported so as to allow individual replacement in case of damage. A detachable lawn conditioning device is provided for performing other lawn conditioning functions.

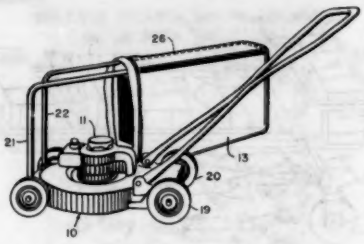
3,777,461
PARTICLE-COLLECTING DEVICE

David Giraud, 408 W. Exchange St., Spring Lake, Mich.

Filed Apr. 13, 1972, Ser. No. 243,611
Int. Cl. A01d *35/22*
U.S. Cl. 56—202 **3 Claims**

A structure is attached to a conventional mower or other machine that normally discharges a stream of high-velocity air

with entrained particles such as grass clippings or chopped leaves. This structure supports a standard refuse bag on a frame receivable into the mouth of the bag, which is secured



to the frame by a constricting tie surrounding the bag and the frame periphery. The bag is additionally supported on the inside by a normally horizontal member secured to the frame.

3,777,462

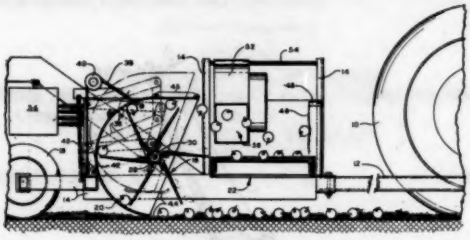
FRUIT HARVESTER

James G. Sharp, and David E. Sharp, both of JI-Meva Farm, North Rose, N.Y.

Filed Mar. 17, 1972, Ser. No. 235,524

Int. Cl. A01g *19/00*

U.S. Cl. 56—328 **8 Claims**



A harvesting machine for picking up fruit, such as apples, which has fallen to the ground and placing it in a box or other suitable container. A drive shaft is concentrically disposed within an elongated shield of uniform, substantially semi-circular cross section. The shaft carries and imparts rotation to a plurality of blade assemblies arranged in closely spaced relation axially along the shaft, each assembly having a plurality of radially extending blades substantially tangential to the drive shaft. The fruit is picked up by the blades, carried around the shield, and propelled against a resilient curtain to drop onto conveying means without bounce or bruise and be transported to the container. Blower means are provided for separating grass, and the like, from the fruit as it is traveling between the blades and the curtain. Means are also provided for selectively tilting the container to avoid bruising the fruit as it is placed therein.

3,777,463

FRUIT-HARVESTING MACHINE AND CONVEYOR THEREFOR

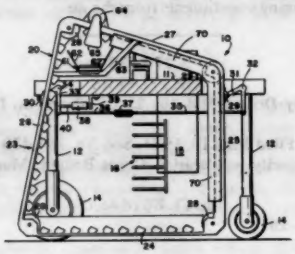
Gerald L. Claxton, Lafayette, Calif., assignor to Up-Right, Inc., Berkeley, Calif.

Filed Sept. 25, 1972, Ser. No. 292,083

Int. Cl. A01g *19/00*

U.S. Cl. 56—330 **13 Claims**

A harvesting machine having an endless belt conveyor for conveying the fruit harvested from plants wherein the fruit falling from the plants is directed to the upper side of the lower flight of the belt which extends lengthwise of the machine, parallel and very close to the ground. The belt carries the fruit and juice to one end of the machine. Spaced



buckets mounted on the belt carry the fruit and juice upwardly to the top of the machine, wherein the belt tilts the buckets to dump the contents therefrom through a blast of air, for leaf removal, and onto a discharge conveyor. The belt returns then downwardly to the other end of the machine.

3,777,464

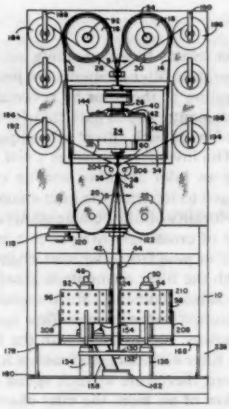
APPARATUS FOR THE PRODUCTION OF CHENILLE

Alexander Gross, 2590 W. Maple Ave., Fenasterville, Pa.

Filed Dec. 16, 1971, Ser. No. 208,748

Int. Cl. D02g *3/42*; **D04d** *3/00*

U.S. Cl. 57—24 **8 Claims**



An apparatus for the production of chenille which includes a bearing mounted flyer arranged for rotation in a horizontal plane and which uprightly carries a plurality of spool mounting spindles thereon. Horizontal rotation of the flyer wraps weft thread from the spindle mounted spools about the warp threads and a pair of endless steel belts. The wrapped weft thread is carried by the belts to a reciprocating knife which severs the wrapped threads which then adhere to the warp threads to form the finished chenille yarn. The finished product is directed to lower positioned spindles which are mounted on a vertically reciprocal platform to aid in uniformly winding the finished product upon a spool carried by the spindle. The lower spindle is provided with a balloon control ring which serves the dual purpose of controlling ballooning on the spindle as the finished product winds upon the spindle and also serves to clean excess material from the finished chenille yarn to thereby provide an improved final product.

3,777,465

PROCESS AND APPARATUS FOR MANUFACTURE OF A THERMOPLASTIC YARN WITH RESIDUAL TWIST

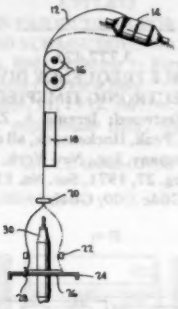
Michel Buzano, Villeurbanne, France, assignor to Societe Rhodiaceta, Paris, France

Continuation-in-part of Ser. No. 95,013, Dec. 4, 1970. This application Oct. 11, 1971, Ser. No. 191,603

Claims priority, application France, Oct. 22, 1970, 7038481; Dec. 12, 1969, 6943178

Int. Cl. D01h 7/52, 13/06

U.S. Cl. 57—34 HS 9 Claims



Process and apparatus for texturizing a thermoplastic yarn to provide a residual twist couple by generating a twist in the yarn as the yarn is unwound and contacting the twisted yarn with a twist barrier ring downstream from a heating element and upstream from a ring and traveller spindle windup system.

3,777,466

METHOD OF REMOVING IMPURITIES AND SIMILAR MATTER FROM STAPLE FIBRES IN RINGLESS SPINNING AND DEVICE FOR PERFORMING SAID METHOD

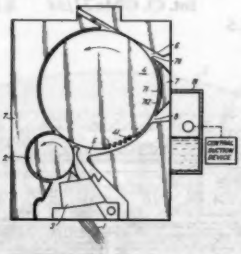
Stanislav Kabele; Ctibor Doudlebsky; Frantisek Jaros; Zdenek Svec, and Bohumir Brozek, all of Usti nad Orlici, Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed May 13, 1970, Ser. No. 36,883

Claims priority, application Czechoslovakia, May 16, 1969, 346/69

Int. Cl. D01h 7/02; D01g 15/00, 23/00

U.S. Cl. 57—58.89 9 Claims



A method of removing impurities from staple fibres in ringless spinning and a device for performing said method. The impurities are ejected immediately after being contacted by the combing roller into a withdrawing space by the effect of the acceleration imparted thereto by said contact. Spinning units including a fibre separating mechanism and a rotary underpressure spinning chamber are employed. The inlet or the guiding walls for said impurities are directed in view of the separating roller tangentially. The withdrawing space can be connected to the central sucking device of the machine.

3,777,467

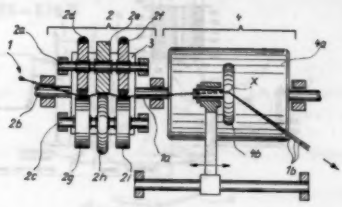
APPARATUS FOR FALSE-TWISTING MULTIFILAMENT THREADS AND THE LIKE

Heinrich Enneking, Karlsruhe, Germany, assignor to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Karlsruhe, Germany

Filed July 17, 1972, Ser. No. 272,629

Claims priority, application Germany, Mar. 22, 1972, P 22 13 851.8

U.S. Cl. 57—77.4 7 Claims



A first false-twisting unit includes three axially parallel shafts of which two carry pairs of cooperating rotary friction members defining respective nips through which the travelling yarn passes for false-twisting and on a third of which a driven friction-drive roller is provided to drive the friction members. A second false-twisting unit includes a first roller coaxial with the friction-drive roller having an axial length substantially greater than the rotary friction members, and a second roller rotatably mounted in axial parallelism with the first roller and engaging the latter with its periphery to form with the first roller a second nip through which the travelling yarn passes to have a final false twist imparted to it and have its filaments moved into mutual parallelism. An arrangement is provided for traversing the second roller axially along the second roller.

3,777,468

RING AND TRAVELER

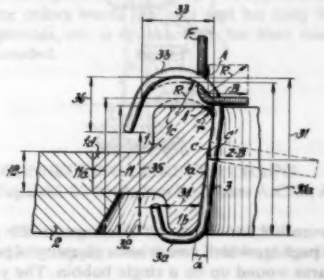
Stefan Furst, deceased, late of Monchengladbach, Germany; by Stefanie Dormanns, 43 Industriestrasse, Wegberg, and by Hans Furst, 28 Ludwig-Weber-Strasse, Monchengladbach, both of Germany (heirs and legal representatives)

Filed Oct. 19, 1970, Ser. No. 81,773

Claims priority, application Germany, Oct. 18, 1969, P 19 52 570.3; Nov. 15, 1969, P 19 57 552.1

Int. Cl. D01h 7/62

U.S. Cl. 57—120 13 Claims



Thread guiding device for ring spinning and ring twisting frames includes a ring having a radially inner engagement sur-

face and a bottom engagement surface, and an ear-shaped traveller mounted on the ring for traveling around the same, the traveller being in engagement only with the inner and bottom engagement surfaces of the ring in the course of travel thereof about the ring.

3,777,469

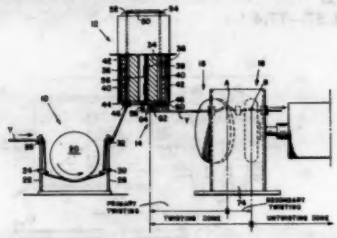
TEXTURING YARNS BY FALSE TWISTING

Richard C. Spurgeon, R. D. No. 2, Lansdale, Pa.

Filed Aug. 3, 1971, Ser. No. 168,709

Int. Cl. D02g *1/02*

U.S. Cl. 57—140 R **10 Claims**



Untextured yarn is drawn from a producer's package, threaded through apparatus comprising a tension leveling device, an electric heater and a false twist device and, having been textured thereby, is wound on yarn take-up means. Close to the yarn exit from the heater is a twist stop device which effectively restricts twisting of the yarn to the downstream side thereof, and close to the downstream side of the false twist device is a check device which effectively restricts to the downstream side thereof the tendency of the yarn to relax due to untwisting thereof.

3,777,470

METHOD OF FORMING A YARN PACKAGE

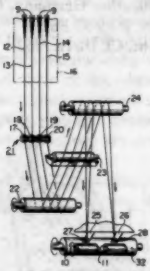
Isamu Suzuki; Jukichi Ohmura, and Yuukoo Satoo, all of Shizuoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 877,727, Nov. 18, 1969, abandoned. This application Feb. 9, 1972, Ser. No. 224,820

Claims priority, application Japan, Nov. 19, 1968, 43/84150

Int. Cl. D01h *1/00, 7/92*

U.S. Cl. 57—157 R **3 Claims**



This invention concerns with a process for the preparation of a yarn package which comprises a plurality of polyurethane elastic yarns wound up on a single bobbin. The yarns are arranged substantially in a plane when seen laterally of the yarn group and provisionally bonded together for providing the possibility of re-separation into the constituent yarns at a later rewinding stage of the package.

According to the invention, a plurality of groups of multifilaments comprising essentially polyurethane as extruded are passed through a corresponding number of false twisters, so as to group the respective filaments together to such a degree that the related filaments are partially fused together to set a mutual core-to-core material communication, yet having a solidified surface skin except the thus realized material communication areas on the filaments.

Then, at least two of the yarns of multifilaments are jointly passed through a skew-grooved traverse for provisionally bonding these yarns together so as to realise a skin-to-skin cobonding, for ready for winding into a yarn package on a single bobbin tube.

3,777,471

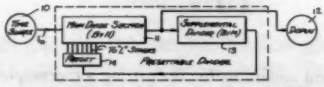
PRESETTABLE FREQUENCY DIVIDER FOR ELECTRONIC TIMEPIECE

Dale R. Koehler, Westwood; Jerrald A. Zupfer, River Vale, and Jan Willem L. Prak, Hackensack, all of N.J., assignors to Bulova Watch Company, Inc., New York, N.Y.

Filed Aug. 27, 1971, Ser. No. 175,662

Int. Cl. G04c *3/00*; G04b *19/00, 27/00*

U.S. Cl. 58—23 R **12 Claims**



An electronic timepiece in which the output of a stable, high-frequency standard such as a crystal oscillator, is fed to a presettable frequency-divider to produce periodic low-frequency output pulses for actuating a time display. The frequency of the oscillator lies in a range somewhat below an assigned value producing, upon division, the desired number of output pulses for accurate timing, the resultant deficiency being made up by adding pulses to input stages of the divider sufficient to compensate therefor. In this way, one may manufacture crystals under far less restrictive tolerances than those imposed when the crystal is required to operate at the assigned frequency.

3,777,472

WATCH WITH ELECTRONIC BUZZER

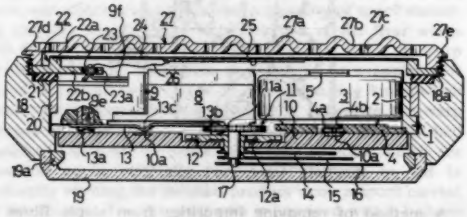
Yoshio Iinuma, Tokyo, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Mar. 22, 1972, Ser. No. 237,137

Claims priority, application Japan, Mar. 30, 1971, 46/18984

Int. Cl. G04c *21/34*

U.S. Cl. 58—57.5 **18 Claims**



An improved electronic alarm watch is disclosed having improvements in the structure and arrangement of the accoustically alarming vibrator employed in the alarm mechanism

thereof. The improved watch of the above type comprises a watch casing, wherein is located a watch movement, alarm switch controlled thereby, alarm oscillator circuit and a battery source adapted for energization thereof. An oscillatory membrane is fixedly attached with a piezo-electric or electrostrictive element which is electrically connected through the switch with the oscillator circuit and the battery for being energized therefrom, the membrane being arranged in a space defined by and between a perforated back cover and the watch movement.

3,777,473

WATCHCASE, IN PARTICULAR FOR A WATERPROOF AND SUBAQUEOUS WATCH

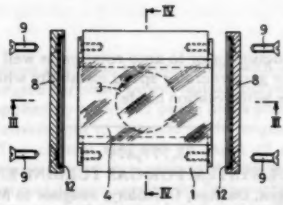
Ennio Bussi Roma, Italy, assignor to Fernando Fontana & C. S.a.s., Sesto Calende (Varese), Italy

Filed Sept. 11, 1972, Ser. No. 287,649

Claims priority, application Italy, Apr. 29, 1972, 23759 A/72

Int. Cl. G04b *37/08*

U.S. Cl. 58—90 R **2 Claims**



Watchcase comprising an enclosure for containing the dial and working mechanism of the watch, an upper transparent seal element and a lower seal element, characterised in that at least one of the seal elements is slidingly coupled to the enclosure and is clamped in position by two side elements which enable suitable gaskets to be interposed and clamped tightly so ensuring an exceptional seal against water and at the same time easy disassembly and reassembly of the seal element.

3,777,474

FLUID-TIGHT CONTROL MECHANISM, FOR EXAMPLE FOR WATCHES

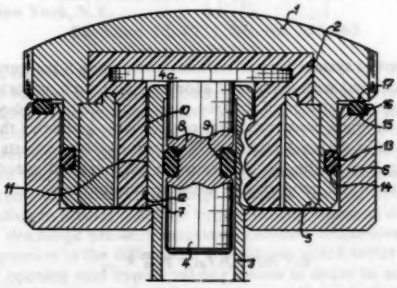
Pierre-Michel Piquerez, Bassecourt, Switzerland, assignor to Ervin Piquerez S.A., Bassecourt, Switzerland

Filed Oct. 4, 1972, Ser. No. 295,009

Claims priority, application Switzerland, Oct. 8, 1971, 14684/71

Int. Cl. G04b *37/08*

U.S. Cl. 58—90 B **1 Claim**



A control mechanism, for example for winding a watch, includes a manually operable button mounted for rotation and axial sliding in a socket, with an inner portion of the button in deformable synthetic material fluid-tightly gripping over a central fixed tube through which passes a control shank whose head is moulded in said inner portion. An annular surface of a cylindrical wall of the socket has a groove housing an O-ring which is axially compressed by a facing annular surface of the button when the button is in an axially depressed rest position.

3,777,475

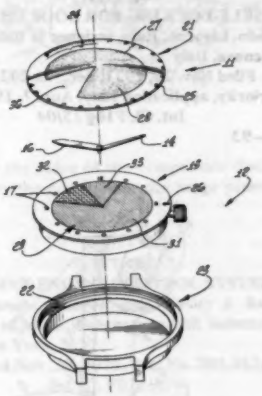
WATCH MOUNTED COUNTER

Murray Grossan, 8930 Sepulveda Blvd., Los Angeles, Calif.

Filed Jan. 29, 1973, Ser. No. 327,451

Int. Cl. G04b *19/00*

U.S. Cl. 58—126 B **4 Claims**



A manually operated counter is mounted on the face of a wristwatch for accumulating and totalizing quantities, such as the daily intake of calories, number of cigarettes consumed, the quantity of pills or other medication taken, etc. The counter is provided by a rotatable member overlying the watch dial face and having an auxiliary scale marked on the periphery thereof. By rotating this member the auxiliary scale may be selectively set relative to an index point on the periphery of the watch casing. A central portion of the rotatable member is generally opaque to form a mask overlying coded warning indicator colors provided near the center of the dial face of the watch. One sector of this opaque mask is transparent to form a window which selectively exposes the indicator colors as quantities, such as daily calories, are accumulated by rotating the member scale. The appearance of certain indicator colors warns the user that his daily intake of calories, cigarettes, etc. is approaching, has been reached, or has been exceeded.

3,777,476

CONNECTING LINKS FOR CHAINS

Alexander Tupalski, 22 Ardlethan St., Fisher A.C.T., Australia (2611)

Filed Aug. 2, 1971, Ser. No. 167,907

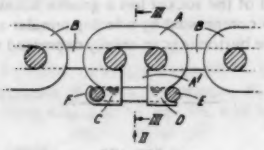
Claims priority, application Great Britain, Aug. 17, 1970, 39,532/70

Int. Cl. F16g *15/00*

U.S. Cl. 59—85 **2 Claims**

A connecting link, for connecting a length of chain to another such length or to an anchorage loop. A body portion

is provided similar to those of the links of the chain but having a gap on one side, through which such links can be passed,



with outward projections flanking such gap for securely receiving a closing member to close the gap.

3,777,477

SELF-LOCKING FOR LOOP CHAINS

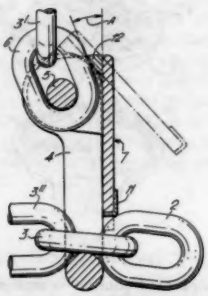
Nunzio Biondo, Livorno, Italy, assignor to Italsider, Societa per Azioni, Genova, Italy

Filed Nov. 26, 1971, Ser. No. 202,131

Claims priority, application Italy, Aug. 7, 1971, 12856 A/71

Int. Cl. F16g *15/04*

U.S. Cl. 59—93 **6 Claims**



A simple but effective device for holding a chain looped around a bundle of elements in a tightened condition. A catch element is associated with an eyelet which is disposed at one end of the chain and through which the other end is passed. The catch is automatically shifted as the chain passes through the eyelet to reduce the size of the loop but moves back to a latching position to prevent the chain moving through the eyelet to enlarge the loop.

3,777,478

METHOD OF AND APPARATUS FOR CONTROL OF HELICOPTER GAS TURBINE ENGINE DURING AUTO-ROTATION

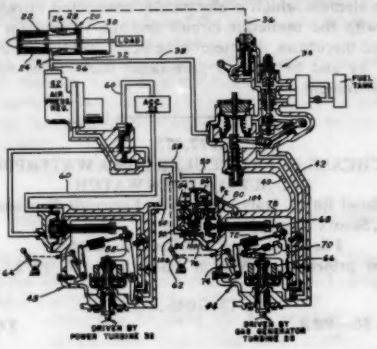
Robert G. Moore, Jr., South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Oct. 28, 1971, Ser. No. 193,385

Int. Cl. F02c *3/10*

U.S. Cl. 60—39.16 R **5 Claims**

Engine governor control apparatus for controlling the power output of a helicopter gas turbine engine having independently rotating gas generator and power turbines. During normal operation gas generator turbine speed is sensed and controlled by a first governor and power turbine speed is sensed and controlled by a second governor operatively connected to the first governor for resetting the speed setting of the first governor. During helicopter practice auto-rotation, the second governor is rendered inoperative to reset the first governor at a predetermined position of a manually actuated engine power request lever to thereby eliminate transient undershoot of gas generator turbine speed during a power turbine load reduction prior to auto-rotation as well as eliminate a tendency for gas generator speed instability while operating in the practice auto-rotation mode.



3,777,479

CONTROL SYSTEM FOR GAS TURBINE ENGINES

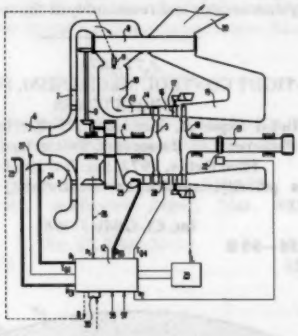
Hermann Hagen, Dachau, Germany, assignor to Motoren-Und Turbinen-Union Munchen GmbH, Munich, Postfach, Germany

Filed Dec. 18, 1970, Ser. No. 99,358

Claims priority, application Germany, Dec. 18, 1969, P 19 63 432.3

Int. Cl. F02c *9/04*

U.S. Cl. 60—39.25 **35 Claims**



A control system for gas turbines comprising a gas generator associated with a variable geometry unit such as variable guide vanes upstream of the free-power turbine of a two-shaft engine having a heat exchanger or a variable geometry thrust nozzle for a turbojet engine. The control system adjusts the working line of the gas generator to each related speed by variation of the geometry by utilizing the function

$$q_1 \cdot p_{o1} = f(T_{o1}) \cdot p \frac{a}{o5} k$$

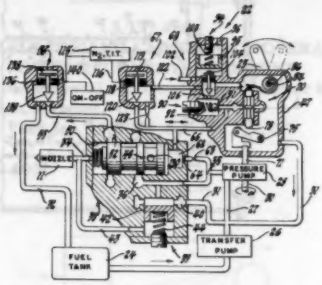
for positioning the gas generator working line and for limiting acceleration or fuel supply.

3,777,480

GAS TURBINE FUEL CONTROL

Donald D. Stoltman, Henrietta, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 20, 1972, Ser. No. 236,373
Int. Cl. F02c 9/10
U.S. Cl. 60—39.28 R 5 Claims



A fuel control disclosed in connection with a gas-coupled gas tubine engine for shaft power output purposes. The fuel control is supplied by a transfer pump and a pressure pump in series and delivers fuel to a nozzle in the engine combustion apparatus. The control receives an input of gas generator speed and an input of compressor discharge pressure. It receives electrical inputs serving to limit turbine inlet temperature and power turbine speed, and may include an electrical On-Off input. Flow of fuel to the engine is directly controlled by a slave valve which responds to pressure of fuel delivered to the nozzle and to a control pressure derived from the pressure pump outlet. The control pressure is developed between an upstream orifice and parallel downstream valves which include a solenoid valve operated to limit turbine inlet temperature and power turbine speed, a valve responsive to compressor discharge pressure, and a governor valve responsive to gas generator turbine speed. The On-Off control bleeds the nozzle to the fuel tank when the engine is turned off. During engine deceleration, the slave valve stops fuel flow without emptying the nozzle and the fuel line to it. The metering head across the slave valve is controlled by a differential pressure responsive by-pass valve which discharges excess fuel to the pressure pump inlet. The by-pass valve may define a passage for fuel to maintain a pilot flame during deceleration.

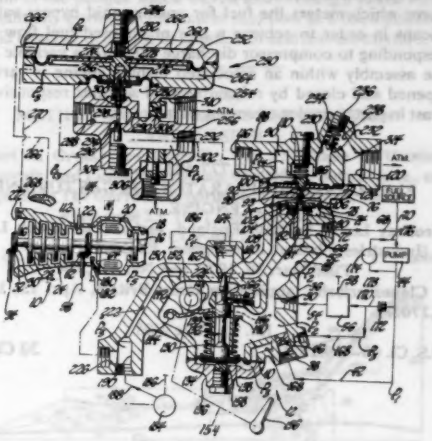
3,777,481

AMBIENTLY COMPENSATED TURBINE ENGINE FUEL CONTROL

Raymond P. Canale, and Leon L. Brantman, both of St. Clair Shores, Mich., assignors to Colt Industries Operating Corp., New York, N.Y.

Filed Dec. 13, 1971, Ser. No. 207,063
Int. Cl. F02c 9/10
U.S. Cl. 60—39.28 5 Claims

A turbine engine fuel control is provided with a fuel inlet, metering-type governor valve assembly responsive to signals generated in response to engine speed and indicia of operator power request, fuel bypass valving means for returning unmetered fuel from the fuel control to an associated fuel supply system, compressor discharge pressure sensing means for tending to further close the bypass valving means as compressor discharge pressure increases, pressure responsive means responsive to the differential in pressures which meter the fuel for opening said bypass valving means in order to achieve a rate of metered fuel flow corresponding to compressor discharge pressure, and additional pressure responsive valving means responsive to ambient conditions and generally interposed between a source of the compressor discharge pressure and the compressor discharge pressure sensing means for at



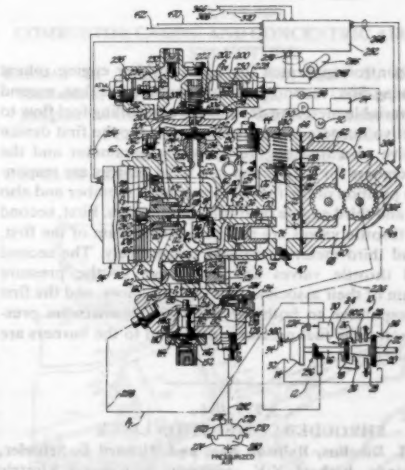
times modifying the value of the compressor discharge pressure as sensed by the compressor discharge pressure sensing means.

3,777,482

TURBINE ENGINE CONTROL SYSTEM

Raymond P. Canale, Warren, and Wesley J. Ross, Sterling Heights, both of Mich., assignors to Colt Industries, Operating Corp., New York, N.Y.

Filed Nov. 30, 1971, Ser. No. 203,313
Int. Cl. F02c 9/10
U.S. Cl. 60—39.28 R 10 Claims



A turbine engine control system, including a fuel control is provided with a fuel inlet, a fuel metering valve assembly responsive to electrical signals generated in response to engine speed and temperature and indicia of operator power request, a fuel bypass valving means for returning unmetered fuel from the area of the fuel metering valve assembly to an

area of low pressure fuel, a compressor discharge pressure sensing means tending to further close the bypass valving means as compressor discharge pressure increases, and a pressure responsive means responsive to the differential in pressures which meters the fuel for opening said bypass valving means in order to achieve a rate of metered fuel flow corresponding to compressor discharge pressure; a variable nozzle assembly within an associated turbine engine is variably opened and closed by related control sections responsive at least in part to engine operating parameters.

3,777,483

FUEL CONTROL APPARATUS FOR GAS TURBINE ENGINE

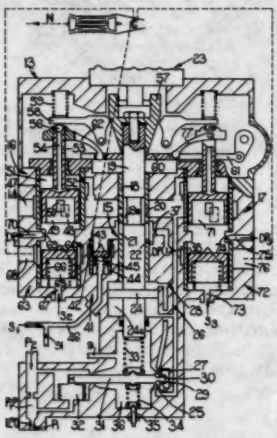
Geoffrey Lewis, Solihull, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Mar. 30, 1972, Ser. No. 239,584

Claims priority, application Great Britain, Apr. 13, 1971, 9,270/71

Int. Cl. F02c *9/08*

U.S. Cl. 60—39.28 R **32 Claims**



A fuel control apparatus for a gas turbine engine reheat system having first, second and third burners has first, second and third variable metering devices for controlling fuel flow to the respective burners. A control member for the first device is responsive to a first engine operating parameter and the control members for the second and third devices are responsive to the position of the first device control member and also to second and third engine operating parameters. First, second and third throttle valves are situated downstream of the first, second and third metering devices respectively. The second and third throttle valves are responsive to the pressure downstream of their associated metering devices, and the first valve is responsive to both the aforesaid downstream pressures, whereby the fuel pressures delivered to the burners are substantially equal.

3,777,484

SHROUDED COMBUSTION LINER

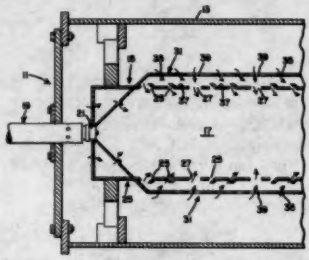
Norman R. Dibelius, Ballston Spa, and Richard B. Schiefer, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 8, 1971, Ser. No. 206,021

Int. Cl. F02c *1/00*

U.S. Cl. 60—39.65 **3 Claims**

A gas turbine combustion chamber having an outer casing and a concentrically mounted inner liner. The inner liner is formed with annular rows of spaced louvers for admitting cooling air and annular rows of spaced primary air holes. A shroud is circumscribed about the inner liner and spaced there from. Annular rows of spaced cooling air holes are formed in the shroud and direct jets of cooling air to hot spots or hot highly stressed areas between the louvers. The presence of the



shroud makes it possible to increase the opening of the louvers for increasing the thickness of a cooling air film. The shroud also is formed with primary air holes which are slightly larger than and in approximate register with the primary air holes in the inner liner.

3,777,485

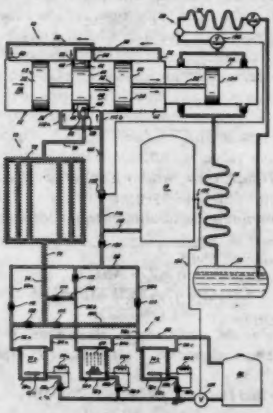
VAPORIZED FLUID POWERED ENGINE

Christopher Plummer Emerson, Lamoni, Iowa, assignor to The Deskin Corporation, Lamoni, Iowa

Filed Mar. 8, 1972, Ser. No. 232,780

Int. Cl. F01k *25/10;* **F25b** *27/00*

U.S. Cl. 60—95 **12 Claims**



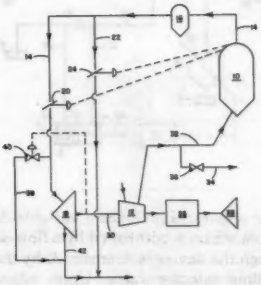
An apparatus and method for converting heat energy to mechanical energy in a closed circuit power unit by alternately expanding and vaporizing and then condensing a working fluid to product a pressure differential utilized to operate a reciprocal engine component such as a piston or diaphragm. The apparatus includes an improved and simplified engine component efficiently operated by the pressure differential resulting from the heating and cooling of the working fluid and also includes a series of non-simultaneously operating combination fluid heat generators and condensors to maintain a continuously available source of heat and cooling for acting on the working fluid. This invention is illustrated in associa-

tion with a motor vehicle air conditioning system where the heated fluid in the normal engine cooling system is utilized to provide heat to the working fluid heat generators in a controlled sequence whereby the heat energy created is utilized to operate the engine component which in turn is coupled to the compressor unit of the air conditioning system or which may otherwise be connected to any other appropriate work load. This new engine is also operable by any other suitable source of heat.

3,777,486
APPARATUS FOR AND A METHOD OF OPERATING POWER RECOVERY EQUIPMENT

Leonard P. Damratowski, Monroeville, Pa., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 29, 1971, Ser. No. 110,987
Int. Cl. F02c 9/00
U.S. Cl. 60—105 **4 Claims**

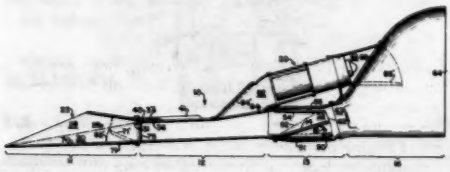


Power recovery apparatus utilizing energy present in the flue gas of a catalyst regenerator of the kind employed in fractional distillation plants wherein the conduit connecting the regenerator and a power recovery turbine is provided with means for rapidly venting the section of a main supply conduit immediately upstream of the turbine to rapidly decrease power recovery turbine output.

3,777,487
METHOD AND APPARATUS FOR REACTION PROPULSION

Leslie W. Norman, Scottsdale, and Skillman C. Hunter, Phoenix, both of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Feb. 9, 1961, Ser. No. 88,149
Int. Cl. F02k 7/10, 3/02
U.S. Cl. 60—204 **7 Claims**

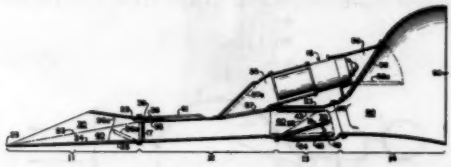


6. A method for developing propulsive reaction at air speeds in excess of sonic velocity comprising: directing an air flow into a confined channel; mixing fuel with said air flow; exciting successive oblique shock waves in said channel to decrease the Mach number and increase the static pressure and static temperature of the flow therein; removing boundary layer air from the channel walls adjacent the terminal ends of certain of the oblique shock waves; and exciting a shock wave substantially normal to the axis of said flow at a fixed position in said channel to induce detonation of said fuel-air mixture.

3,777,488
METHOD AND APPARATUS FOR REACTION PROPULSION

Robert A. Gross, New Rochelle, N.Y.; Skillman C. Hunter, Phoenix, and Leslie W. Norman, Scottsdale, both of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed June 23, 1961, Ser. No. 119,154
Int. Cl. F02k 7/10
U.S. Cl. 60—204 **11 Claims**

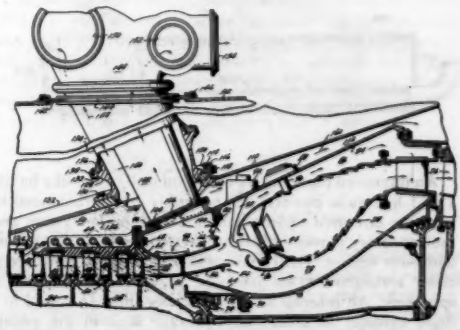


9. A method of operating an aerothermodynamic duct which comprises the steps of: moving the duct through the air at a Mach number high enough to create a normal shock wave at the inlet end of the duct; bleeding air from the duct at a point spaced longitudinally from the inlet to cause the shock wave to enter the duct; interrupting the air bleeding step to cause the shock wave to move downstream of the duct beyond the point where the air was bled therefrom to a predetermined location; supplying fuel to the duct for mixture with the air and subsequent detonation upon passage through said normal shock wave; and expanding the heated products of the detonation in the downstream end of said duct to impart forward movement to the duct.

3,777,489
COMBUSTOR CASING AND CONCENTRIC AIR BLEED STRUCTURE

Kenneth O. Johnson, Indian Hill; Peter F. Kepf, New Richmond, and Alfred St. George, West Chester, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed June 1, 1972, Ser. No. 258,884
Int. Cl. F02c 3/12; F02k 3/06
U.S. Cl. 60—226 R **10 Claims**



Combustor casing and bleed structure provides a concentric flow path for compressor discharge and intermediate stage air

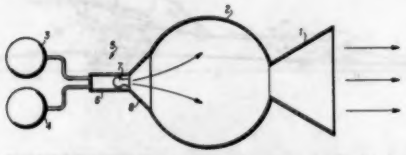
from a turbofan engine compressor to an outer cowling defining the fan flow path. Concentric tubes are respectively mounted to a support cone, which includes a plurality of outlet guide vanes, and to an outer casing, which partially defines the fan flow path. External piping is thus limited to the concentric tubes and potential losses due to interference with the fan flow are avoided.

3,777,490

SUPERSONIC-COMBUSTION ROCKET

Richard J. Weber, Cleveland, and Leo C. Franciscus, Lakewood, both of Ohio, assignors to The United States of America as represented by the Secretary of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 10, 1972, Ser. No. 233,519
Int. Cl. F02k 9/02
U.S. Cl. 60—258 5 Claims



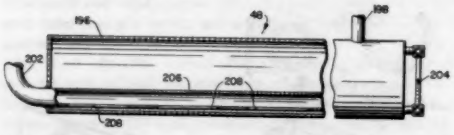
A supersonic combustion rocket is provided in which a small rocket motor is substituted for heavy turbo pumps in a conventional rocket engine. The substitution results in a substantial reduction in rocket engine weight. The flame emanating from the small rocket motor can act to ignite non-hypergolic fuels.

3,777,491

PUMPING AND SERVICING RIG

Emil A. Bender, 6625 Kane Way, Bakersfield, Calif.

Filed July 24, 1972, Ser. No. 274,248
Int. Cl. F15b 1/02
U.S. Cl. 60—372 10 Claims



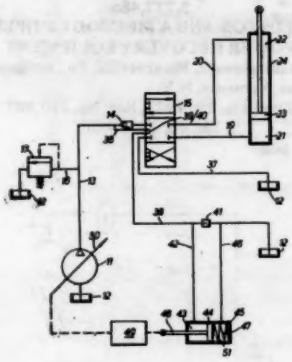
An improved pumping rig for an oil well or the like having a 2 to 1 hydraulic powered lift assembly counterbalanced by a separate circuited hydropneumatic cushioning system and a reciprocatory movement control system using a third separate hydraulic circuit. The crown assembly includes a sheave and strap arrangement in place of unsatisfactory chains and sprockets. An internal safety bleed system is provided in the drive cylinder to create an hydraulic lock in the event of piston overtravel due to rod string failure or other malfunction. The hydropneumatic cushioning system includes vertical cylinders in fluid communication with air-hydraulic fluid surge tanks having slotted, anti-slosh tubes therein.

3,777,492

HYDRAULIC APPARATUS INCLUDING VARIABLE DELIVERY PUMPS

Kenneth Raymond Boydell, Bredons, Hardwick, near Tewkesbury, and John Christopher Eglington Flint, Stroud, both of England, assignors to Dowty Technical Developments Limited, Brockhampton, Cheltenham, England

Filed Feb. 17, 1971, Ser. No. 116,211
Int. Cl. F15b 15/18; F04b 49/00
U.S. Cl. 60—462 6 Claims



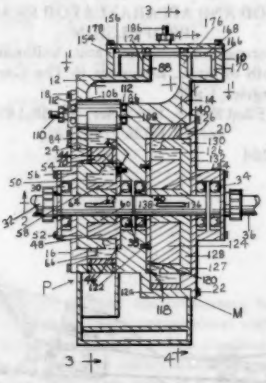
An hydraulic apparatus includes a variable-delivery pump, the delivery from which is controlled by a flow-sensing device. The flow through the device is determined by the position of a service-controlling selector valve. Upon adjustment of the selector valve from one position to another, the pump delivery is changed so as substantially to be in correspondence with the flow permitted by the new position of the selector valve.

3,777,493

DRIVE TRANSMITTING MECHANISM

Charles E. Graham, 8021 S.W. Mapleleaf St., Portland, Oreg.

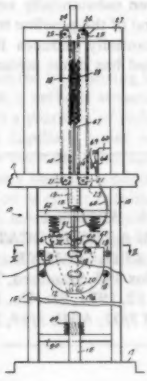
Filed Dec. 20, 1971, Ser. No. 209,677
Int. Cl. F16h 39/04
U.S. Cl. 60—493 3 Claims



A drive transmitting mechanism having an input shaft and an output shaft. The input shaft rotates a pump having slidable vanes operative between inner and outer eccentrics for pumping fluid from an inlet to a rotary motor through valve control means. The rotary motor, similar to the pump, includes a driver having a plurality of slidable vanes operative between

inner and outer eccentrics. Control means includes a first valve portion which regulates the output of the pump and a second valve portion which regulates flow to the rotary motor. The first valve portion includes a rotatably adjustable cylinder-like member having a segmental wall portion cooperating with a passageway in the housing from the pump for controlling output of the pump. The second valve means also includes a rotatably adjustable member capable of receiving fluid from the pump and selectively directing it through openings and passageways to the rotary motor for accomplishing forward drive, reverse drive and neutral.

3,777,494
WAVE ENERGY MOTORS
Alfred Soderlund, 1014 Forest Ave., Evanston, Ill.
Filed Jan. 10, 1972, Ser. No. 216,607
Int. Cl. F03c *5/00*
U.S. Cl. 60—507 **16 Claims**

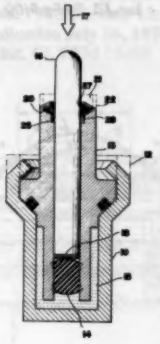


Wave energy is harnessed through pontoons riding on an ocean surface and guided for vertical movement to drive a vertical transmission bar reciprocably relative to a pair of parallel endless driving chains which are alternately driven by the reciprocating transmission bar to drive respective shafts rotatably, such shafts being coupled drivingly to a machine driving shaft carrying a flywheel for assuring uniform rotary motor power derived from the reciprocating power source motion. Fixed offshore platform and floating platform arrangements are provided.

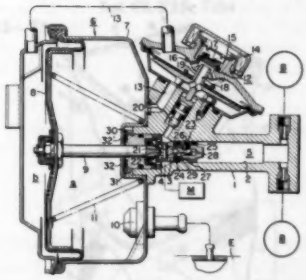
3,777,495
THERMAL RESPONSIVE POWER ELEMENT
Yoshikazu Kuze, No. 31-3, 1-chome, Magome, Higashi, Otaku, Tokyo, Japan
Filed Feb. 7, 1972, Ser. No. 223,878
Claims priority, application Japan, May 28, 1971, 46/26330; Feb. 10, 1971, 46/6472
Int. Cl. F03g *7/06*
U.S. Cl. 60—530 **2 Claims**

A thermal responsive power element has a heat sensitive chamber with a guide spool fixedly mounted therein to define an annular space therebetween. The guide spool has an axial bore passing therethrough provided with a self-equipped miniature seal packing at the outer open end portion for an actuating rod slidably guided therein.

A rubber or rubber-like sealing plug is mounted in said bore with one end in contact with one end of said actuating rod. The sealing plug is diverging toward both ends thereby forming a fluid tight seal in the bore. A thermal responsive expansive substance fills the annular space and, upon application of heat, expands, exerting a force on the plug and the actuating rod. The guide spool is provided with a self-equipped miniature seal packing with lips at the outer open end portion of the guide spool.



3,777,496
VACUUM TYPE SERVO DEVICE
Mitutoyo Mizusawa, Chiisagata-gun, and Hiroo Takeuchi, Kitasaku-gun, both of Japan, assignors to Nisshin Kogyo Kabushiki Kaisha, Ueda-shi, Nagano-ken, Japan
Filed July 5, 1972, Ser. No. 269,254
Claims priority, application Japan, Sept. 7, 1971, 46/69079
Int. Cl. F15b *7/08*
U.S. Cl. 60—593 **2 Claims**



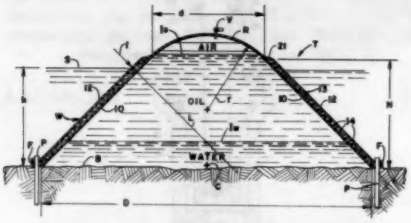
A vacuum type servo device exhibiting an improved output pressure characteristic and free from any substantial echoing in the vacuum servo actuator. It includes a lost motion connection between the actuator rod and the hydraulic piston and a control valve arranged between the input and output fluid chambers of the hydraulic cylinder and which is normally open and closable upon initiation of the actuator operation. It also includes cushioning means arranged between the hydraulic piston and the actuator casing.

3,777,497

STORAGE TANK FOR OFFSHORE STORAGE OF LIQUID AND METHOD OF CONSTRUCTING AND INSTALLING SAME

Norman W. Edwards, Sewickley, Pa., assignor to Pittsburgh-Des Moines Steel Company, Pittsburgh, Pa.

Filed May 5, 1972, Ser. No. 250,732
Int. Cl. B65g 5/00
U.S. Cl. 61—46.5 17 Claims



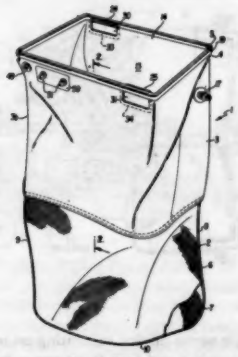
A storage tank for offshore storage of liquid such as oil and the like and the method of constructing and installing same, wherein the storage tank has a side wall with the shape of a frustum of a hollow right circular cone and an enlarged diameter base or lower end and a reduced diameter top or upper end having a roof thereon, the frusto-conical configuration of the side wall of the tank substantially reducing the forces acting on the tank from a surrounding body of water or from wind or the like, and further resulting in a low center of gravity of the tank and a large water plane area so that the tank is inherently stable for towing in a body of water.

3,777,498

METHOD AND APPARATUS FOR FACILITATING DIVER OPERATIONS

Del Andrews, 630 Porter Ln., Hermosa Beach, Calif., and Ora Florentine Kuhlman, 4258 Exultant Dr., Palos Verdes Peninsula, Calif.

Filed July 29, 1971, Ser. No. 167,288
Int. Cl. B63c 11/00
U.S. Cl. 61—69 R 8 Claims



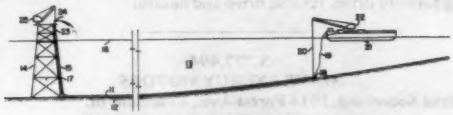
A flexible diver's bag which may be inflated by a diver at a submerged location. The bag includes a perforate section within which an article such as a game specimen may be disposed. A bag closure mechanism operably independent of a bag buoyancy chamber means, is also provided.

3,777,499

OFFSHORE PIPELINE RECOVERY

Jamie F. Matthews, Jr., Houston, Tex., assignor to Esso Production Research Company, Houston, Tex.

Filed June 14, 1972, Ser. No. 262,815
Int. Cl. B63c 7/12; F16l 1/00
U.S. Cl. 61—72.3 20 Claims



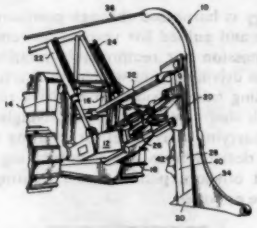
An offshore pipeline is recovered from the bottom of a body of water by introducing gas into one end of the line and pumping liquids from the other end of the pipeline until a section of the line at least sufficiently long to reach to the surface of the body of water has been substantially voided of liquids, and thereafter lifting the end of the pipeline to the water's surface. This procedure substantially reduces the cost of pipeline recovery operations and has other advantages over methods used in the past.

3,777,500

PLOW HAVING A RECIPROCATING BLADE ATTACHMENT

Leon O. Kelley, P. O. Box 488, Stamford, Tex.

Filed Oct. 12, 1971, Ser. No. 188,030
Int. Cl. E02f 5/02; A01b 3/64; F16l 1/00
U.S. Cl. 61—72.6 11 Claims



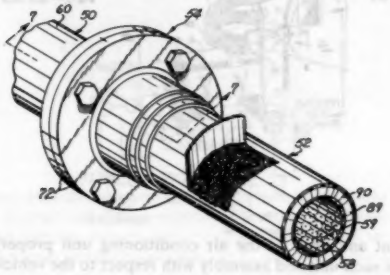
The specification discloses a cable laying plow including a plow shank for connection to a prime mover. A plow point is mounted on the forward edge of the bottom of the plow shank, with guide structure connected to the rear of the plow shank for directing cable downwardly along the rear edge of the plow shank. An elongated frame slidably receives the forward edge of the plow shank and extends downwardly into the plow point. Sharpened teeth are formed along the forward edge of the frame for assisting in plowing operations and for cutting vegetation and the like. Pins on the plow shank extend through slots in the frame to limit the movement of the frame vertically with respect to the plow shank. A motor is mounted on top of the plow shank and linkage extends from the motor to the frame for reciprocating the frame along the forward edge of the plow shank during plowing operations.

3,777,501

CAPILLARY INSULATION

Richard A. Sharp, Lakewood; John P. Gille, and Jay L. McGrew, both of Littleton, all of Colo., assignors to Martin Marietta Corporation, New York, N.Y.

Filed Mar. 12, 1971, Ser. No. 123,794
Int. Cl. F17c *1/12*
U.S. Cl. 62—45 13 Claims



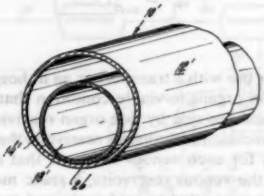
Capillary insulation for transferring low temperature liquids is provided in which a cellular structure is in the form of a cylinder, and defines a plurality of radially extending discrete cells enclosed by a capillary cover with capillary openings communicating with each cell. The cylindrical capillary insulation may be used as a hose or conduit for the transfer of low temperature liquids or as either external or internal insulation for tubes or pipes. A method of manufacturing the cylindrical capillary insulation is disclosed, together with a specific insulated joint construction for interconnecting sections of the insulation.

3,777,502

METHOD OF TRANSPORTING LIQUID AND GAS

James C. Michie, III, and Richard C. M. Calvert, III, both of Newport News, Va., assignors to Newport News Shipbuilding and Dry Dock Company, Newport News, Va.

Filed Mar. 12, 1971, Ser. No. 123,569
Int. Cl. F17d *1/04*
U.S. Cl. 62—55 1 Claim



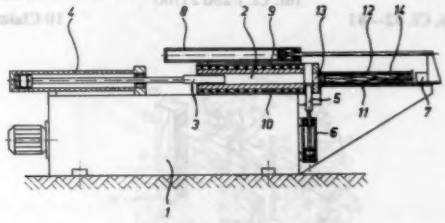
Method of simultaneously transporting liquid and gas within a pipeline, such that the gas serves as an insulator for the liquid and as a sealant for the liquid in case of pipeline failure. A liquid passage is supported substantially axially with respect to an outer gas passage, such that the gas flows annularly of the flowing liquid.

3,777,503

METHOD OF PRODUCING DEEP-FROZEN FILLET BLOCKS

Hermann Walter Gehlen, Kaiserslautern, Pfalz; Karl Hartmann, Bremerhaven, and Gerhard Thieme, Kaiserslautern, Pfalz, all of Germany, assignors to Eisenwerke Kaiserslautern GmbH, Kaiserslautern/Pfalz, Germany

Division of Ser. No. 798,915, Feb. 13, 1969, Pat. No. 3,706,209. This application July 16, 1970, Ser. No. 62,786
Int. Cl. F25d *25/00*
U.S. Cl. 62—62 1 Claim



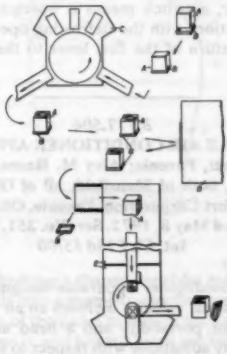
Fillet blocks of fish and other meat are produced by deep-freezing the fresh fillets to be treated and compressing the same while in deep-frozen condition into blocks of predetermined weight and dimension. Apparatus for the carrying into effect the process comprises a deep-cooled compression chamber, a pressure and ejection piston mounted for displacement therein, and a closure piston acting as a closure valve for said chamber, to enable compression of a fillet portion placed in said chamber into a block in the closed position of said closure piston, as well as ejection of the block formed by said pressure piston in the open position of said closure piston, respectively. A third feeding piston serves to introduce the pre-frozen fillets into the chamber in the open position of the closure piston.

3,777,504

PROCESS AND APPARATUS FOR THE MANUFACTURE OF FROZEN DESSERTS

Antonio Marchi, Parma, Italy, assignor to Foodice Engineering Italiana S.p.A., Parma, Italy

Filed July 26, 1972, Ser. No. 275,266
Claims priority, application Italy, Apr. 1, 1972, 46846 A/72
Int. Cl. F25c *7/04*
U.S. Cl. 62—73 12 Claims



Italian Cassatas are manufactured by positioning topless polygonal containers having separable bottoms in holes in a

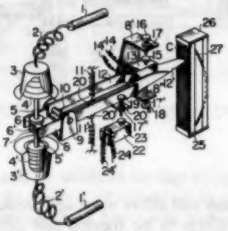
rotating turret which positions them successively beneath a plurality of stations, each of which introduces a different type of ice cream. The filled containers are then frozen, the separable bottoms removed, and the containers filled with ice cream cut into triangular segments by pushing them downwardly through a set of cutting blades.

3,777,505

DEFROSTING METHOD AND APPARATUS

Takashi Otaki, Okazaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 21, 1971, Ser. No. 164,540
Int. Cl. F25d *21/06*
U.S. Cl. 62—81 **10 Claims**



In a method of defrosting a first heat exchanger, on the heat source side of refrigerating apparatus having a second heat exchanger on the utilization side and a fluid flow circuit interconnecting the two heat exchangers, the maximum temperature difference between the inlet fluid temperature and the outlet fluid temperature of the second heat exchanger is determined. During operation of the refrigeration apparatus, the difference between the inlet and outlet fluid temperatures of the second heat exchanger is detected and, when the ratio of the detected temperature difference to the maximum temperature difference decreases below a preset value, due to icing or frosting of the first heat exchanger, defrosting of the first heat exchanger is initiated. The apparatus includes temperature sensing means detecting the inlet fluid temperature and the outlet fluid temperature of the second heat exchanger and conjointly controlling swinging of a first lever about a pivot. In moving toward the maximum temperature difference, the first lever carries with it a second lever which is pivoted coaxially with the first lever. When the temperature difference decreases, the first lever moves in the reverse direction with the second lever being retained in its position and, after a preselected movement of the first lever relative to the second lever, a switch means is operated to initiate the defrosting operation, with the defrosting operation being terminated upon return of the first lever to the position of the second lever.

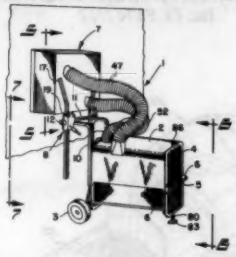
3,777,506

PORTABLE AIR CONDITIONER APPARATUS

Robert N. Hergatt, Pavonia; Alvy M. Hazen, Mansfield, and Joseph Priess, both of Mansfield, all of Ohio, assignors to Camper Comfort Corporation, Pavonia, Ohio

Filed May 8, 1972, Ser. No. 251,185
Int. Cl. F25d *15/00*
U.S. Cl. 62—237 **16 Claims**

Portable air conditioner apparatus designed primarily for use with recreational vehicles includes an air conditioner unit having wheels for portability and a head adaptor assembly which is vertically adjustable with respect to the unit for alignment with a window in the vehicle. The head adaptor unit consists of an insulated pan communicating with the air conditioner unit through flexible hoses. The pan is sufficiently deep to receive jalousie windows or the like when open, and has a peripheral gasket about its open end for sealing contact with the vehicle. Leveling mechanisms may be provided on both the front and back of the air conditioning unit properly to position such unit and assembly with respect to the vehicle for effectuation of a tight seal.

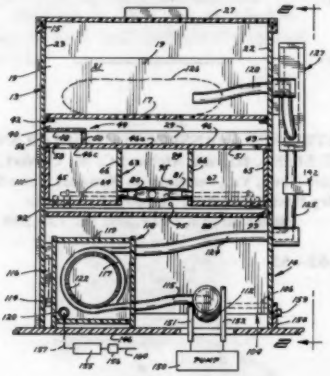


3,777,507

RENAL PRESERVATION SYSTEM

Thomas A. Burton, Rochester, and Allen W. Moberg, Minneapolis, both of Minn., assignors to Waters Instruments, Inc., Rochester, Minn.

Filed Nov. 24, 1971, Ser. No. 201,739
Int. Cl. C12k *9/00*; A61m *1/03*; A61b *19/00*
U.S. Cl. 62—306 **27 Claims**



A cassette for use with a transport or an in-hospital support module to retain organs in viable condition that is generally boxed shaped and has side by side organ receiving chambers in fluid communication with venous reservoirs therebeneath, a flowmeter tank for each venous reservoir that is at a lower elevation than the venous reservoirs, a static membrane oxygenator fluidly connected to said tanks and mounted in an oxygenator chamber below the venous reservoirs, an arterial reservoir in gravity liquid flow communication with the oxygenator, a pulsatile pump head connected to the arterial reservoir, a heat exchanger fluidly connected between said pump head and a bubble trap, and conduits from the bubble trap to the organ chambers. The cassette is preferrably made of a disposable material such as plexiglass. The modules have a pulsatile pump chamber, a gas source, a refrigeration source to furnish a cooling fluid to the heat exchanger, and pressure temperature and pump rate controls.

3,777,508

HEAT PUMP TYPE AIR CONDITIONING SYSTEMS

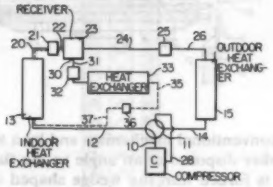
Satoshi Imabayashi; Koichiro Yamaguchi, and Shiego Murase, all of c/o Matsushita Electric Industrial Company Limited , No. 1006, Oaza Kadoma, Kadoma City, Osaka, Japan

Filed Sept. 6, 1972, Ser. No. 286,545

Claims priority, application Japan, Sept. 6, 1971, 46/69105 (utility model); Sept. 20, 1971, 46/73684 (utility model); Sept. 8, 1971, 46/82036 (utility model)

Int. Cl. F25b *13/00*

U.S. Cl. 62—324 16 Claims



A heat pump has a compressor, a discharge gas tube, a condenser, a receiver, an expansion valve, an evaporator, and a suction gas tube connected in series in the order named. The receiver is also connected to the discharge gas tube by a bypass line including a liquid pump, a heat exchanger having an electric heater, and a control valve. At times, such as at low outdoor temperatures or at starting-up, with the control valve opened and simultaneously with the liquid pump actuated, a portion of the refrigerant liquid stored in the receiver is supplied into the heat exchanger where it is evaporated by heat from the electric heater. Hot evaporated refrigerant flows from the heat exchanger through the control valve into the discharge gas tube, and through the latter into the condenser. When condensed, the refrigerant gas releases the heat received from the heat exchanger, greatly increasing the heating effect.

3,777,509

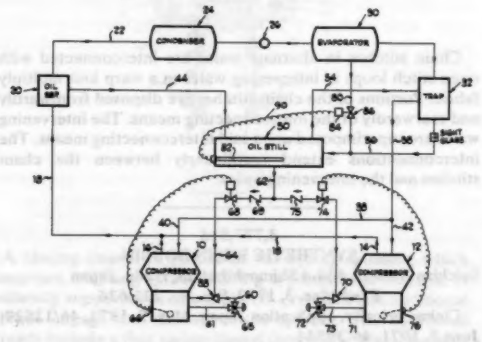
OIL RETURN SYSTEM FOR REFRIGERATION APPARATUS

Paul W. Muench, Medford Lakes, N.J., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 13, 1972, Ser. No. 233,895

Int. Cl. F25b *43/02*

U.S. Cl. 62—470 2 Claims



Apparatus for assuring return of oil separated from refrigerant in a vapor cycle refrigeration system. Means are provided for positively effecting flow of oil from a lower pressure reservoir into a crankcase of a compressor which is normally maintained at a higher pressure. Such means may take the form of an eductor powered by flow of lubricating oil in a closed circuit with respect to the compressor.

3,777,510

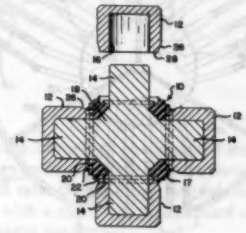
POWER TRANSMITTING JOINT ARRANGEMENT

John C. McElwain, Rochester, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 12, 1971, Ser. No. 171,239

Int. Cl. F16d *3/26*

U.S. Cl. 64—17 A 1 Claim



A spider used in a power transmitting joint has a plurality of projecting trunnions that each receive a cup-shaped bearing capable of rotational movement relative thereto. An integral resilient means has end surface sealing means surrounding each trunnion and in sealing contact with the surface of the end of each bearing proximate the spider while allowing relative rotational movement between each bearing and trunnion.

3,777,511

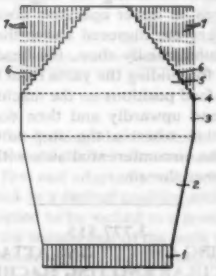
KNITTED GARMENT PANEL

Max William Betts, Coventry, and Frank Robinson, Borrowash, both of England, assignors to Courtaulds Limited, London, England

Filed July 29, 1971, Ser. No. 167,173

Int. Cl. D04b *7/10*

U.S. Cl. 66—76 3 Claims



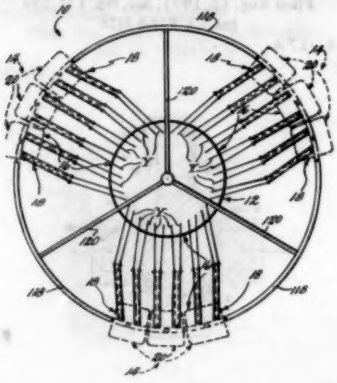
A method of knitting a shaped panel for making up together with other panels into a garment; needles are taken out of action at the edges of the panel to reduce the number of wales in the panel to shape it, and knitted loops are held on the inactive needles whilst knitting continues, at a later stage, said inactive needles are brought back into knitting action again or the loops are cast off.

3,777,512

CREEL ASSEMBLY INCLUDING STOP MOTION DEVICES FOR CIRCULAR KNITTING MACHINES

Arthur L. Burnet, and Joe F. London, Jr., both of Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Mar. 31, 1972, Ser. No. 240,141
Int. Cl. D04b 15/40
U.S. Cl. 66—125 R 11 Claims



A creel assembly including a plurality of frame sections, each being made up of a plurality of modular units, the frame sections being supportable in braced relation on a common horizontal support surface with a circular knitting machine in radially outwardly spaced relation to the periphery of the machine and in annularly spaced relation thereabout so as the define a circumferential aisle on the horizontal support surface extending about the periphery of the machine and a plurality of access aisles of a number equal to the number of frame sections communicating with the exterior of the circumferential aisle at annularly spaced positions, the frame sections carrying transfer tail yarn packages in generally vertically extending aligned relation to a target eye at convenient vertical levels permitting storage of yarn packages on the horizontal support surface therebelow, the frame sections providing yarn guide elements including weighted self-cleaning friction disc assemblies for guiding each yarn from the target eye to an outlet eye, a pull-out stop-motion device associated with each outlet eye and a plurality of spring biased over-center parallel linkage mechanisms mounting the stop-motion devices for movement between an upper operative position wherein the stop-motion devices are disposed above the circumferential aisle a distance substantially above the head of the operator stationed therein for guiding the yarns from the outlet eyes to the associated in-feed positions on the machine along angular paths which extend upwardly and then downwardly and a lower feed position wherein the stop-motion devices are disposed above the circumferential aisle within easy reach of an operator stationed therein.

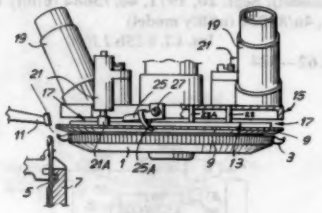
3,777,513

YARN CLAMPING AND CUTTING ATTACHMENT FOR CIRCULAR KNITTING MACHINES

Paolo Conti, Florence, Italy, assignor to G. Billi & C. S.p.A., Firenze, Italy

Filed Dec. 7, 1970, Ser. No. 95,585
Claims priority, application Italy, Dec. 12, 1969, 4885 A/69
Int. Cl. D04b 15/61
U.S. Cl. 66—140 R 4 Claims

An auxiliary clamp to hold an elastic yarn in combination with a conventional yarn cutting and holding mechanism of the type used on a circular hosiery knitting machine and in which pneumatic means is used to hold the yarns. While the pneumatic means is capable of holding the ends of non-elastic yarns it is not capable of holding the ends of elastic yarns. The clamp is self-acting and provides a wedge shaped opening to hold the elastic yarn, the opening being defined by a flat surface of the conventional mechanism and by a straight edge of a plate member disposed at an angle to the flat surface. The elastic yarn is forced into the wedge shaped opening of the clamp by the movement of the inactivated elastic yarn itself as the last needle taking the same moves around the machine.

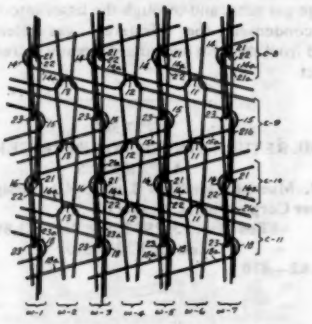


3,777,514

KNITTED FABRIC

Martin Traumuller, Dumont, and Fred Hunneke, Tenafly, both of N.J., assignors to Domestic Fabrics Corporation, Englewood, N.J.

Filed May 27, 1971, Ser. No. 147,353
Int. Cl. D04b 7/64
U.S. Cl. 66—196 6 Claims



Chain stitches in alternate wales are interconnected with open stitch loops in intervening wales in a warp knit multiply fabric. Portions of the chain stitches are disposed frontwardly and rearwardly of the interconnecting means. The intervening wales are superimposed upon said interconnecting means. The interconnections extend rectilinearly between the chain stitches and the intervening wales.

3,777,515

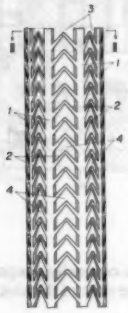
SYNTHETIC RESIN BOBBIN

Soichiro Hattori, 444-4 Shimoshibutani, Ikeda, Japan

Filed Mar. 3, 1972, Ser. No. 231,624
Claims priority, application Japan, Mar. 9, 1971, 46/12629; June 5, 1971, 46/39544
Int. Cl. B65h 75/22
U.S. Cl. 68—198 6 Claims

A synthetic resin bobbin comprising at least one contractable wall constituting a desired portion of peripheral side wall

of a tubular synthetic resin bobbin main body. The contractable wall is composed of a plurality of connecting members bent in a V-shaped or inverted V-shaped form and arranged vertically along the vertical wall of the main body. When the



bobbin is subjected to pressure due to the shrinkage of yarn wound thereon, the connecting members are elastically contracted at their bent portions to contract the contractable wall.

3,777,516

CLOSING DEVICE IN PARTICULAR FOR DYEING SPINDLES

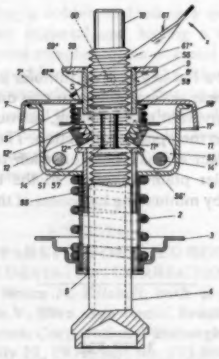
Gerhard Tigges, Wuppertal-Cronenberg, Germany, assignor to Firma Lebrecht Tigger K.G., Wuppertal-Cronenberg, Germany

Filed Apr. 10, 1972, Ser. No. 242,713

Claims priority, application Germany, Apr. 10, 1971, P 21 17 526.8

Int. Cl. B65h *49/20*

U.S. Cl. 68—198 **8 Claims**



A closing sleeve, in particular for dyeing spindles, which comprises a dyeing spindle having a plurality of threads. A resiliently supported pressure plate is provided and additional threads engage the threads of the spindle. The additional threads include a first spring-biased thread jaw which engages resiliently the spindle and a second spring-biased thread jaw is disposed opposite the first thread jaw in thread engaging position. A single release handle controlls both thread jaws into the disengaging position.

3,777,517

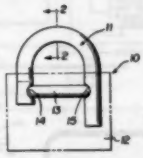
SAW AND IMPACT RESISTANT LOCK SHACKLE

Warren M. Shwayder, and Baruch Sear, both of Birmingham, Mich., assignors to Warren M. Shwayder, Bloomfield Hills, Mich.

Filed June 7, 1972, Ser. No. 260,397

Int. Cl. E05b *67/06, 63/00*

U.S. Cl. 70—53 **4 Claims**



A lock shackle formed of an elongated metal core having longitudinally extending shallow grooves formed in its surface, and a thin wall tube closely fitted around the core, with the grooves filled with a matrix formed of hard carbide particles and a soft material binder.

3,777,518

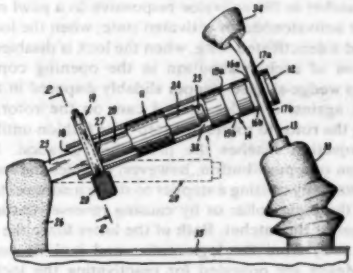
APPARATUS FOR LOCKING GEAR SHIFT STICK AND HANDBRAKE LEVER OF A MOTOR VEHICLE

Calvin E. Meyers, Freeport, N.Y., assignor to Bug-Lok Corporation, Freeport, N.Y.

Filed Mar. 23, 1972, Ser. No. 237,320

Int. Cl. E05b *65/12;* **G05g** *5/10*

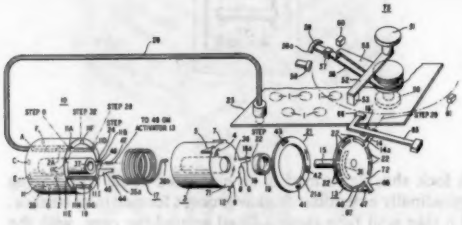
U.S. Cl. 70—200 **6 Claims**



The apparatus for locking the handbrake lever and gear shift stick of a motor vehicle is a two-ended body having means adjacent a first end adapted to securely hold a portion of the gear shift stick in a desired position and means adjacent its second end adapted to be locked to a portion of the handbrake lever when the second end of the body is fitted over the handbrake. The means adjacent the first end of the body comprises a slot cut through the surface of the body extending around about one-half of the periphery of the body and merging at right angles at each of its ends with a straight slot which extends towards but terminates some distance from the first end of the body. The means adjacent the second end of the body comprises two slots cut through the surface of the body which each extend around slightly less than one-half the periphery of the body and which are adapted to receive a shackle of a padlock assembly. The shackle has a thickened portion which forms a restriction in an open bore in the body

adjacent the second end and thereby prevents removal of the body from the handbrake lever when the padlock assembly is locked.

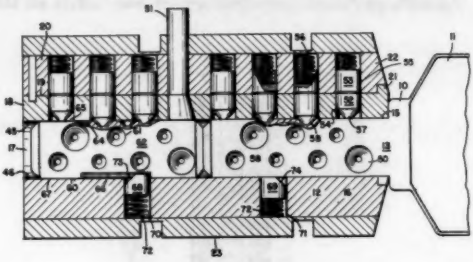
3,777,519
CYLINDRICAL GEOMETRY PUSHBUTTON COMBINATION LOCK
Charles E. Germanton, 38 Mountain Ave., Summit, N.J.
Filed Dec. 27, 1971, Ser. No. 212,563
Int. Cl. E05b *13/00, 37/16*
U.S. Cl. 70—220 **19 Claims**



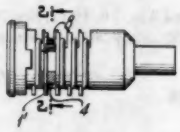
In a high security pushbutton combination lock the depression of a particular subset of pushbuttons in accordance with a first or opening combination and in a "walking" manner causes the step-wise rotation of a control projection to a prescribed location and permits the outer door knob assembly to engage the inner door knob assembly thereby unlatching the door. Mounted along a common axis are a cylindrical stator, a cylindrical rotor resiliently coupled to and rotatably disposed within the stator and including the control projection extending radially therefrom, an annular logic collar affixed to the rotor, a circular apertured activator resiliently coupled to and rotatably disposed and axially slidable within the stator, and a ratchet in the activator responsive to a pawl on the rotor. The activator has an activated state, when the lock is normal, and a deactivated state, when the lock is disabled. Proper operation of each pushbutton in the opening combination causes a wedge-shaped stepper slidably disposed in the stator to urge against a wedge-shaped cam on the rotor, thereby causing the rotor to rotate in a step-wise fashion until the control projection reaches the prescribed location. Improper operation of a push-button, however, disables the lock in one of two ways: by causing a stepper to strike a nonapertured portion of the logic collar or by causing reverse rotation of the pawl against the ratchet. Both of the latter force the activator axially away from the logic collar and into its deactivated state. Means are provided for reactivating the lock via the input of a second or reactivating combination which returns the activator to its activated state.

3,777,520
LOCK ASSEMBLY OF THE ROTARY CYLINDER TYPE
Alois Crepinsek, San Jose, Calif., assignor to Security Technology Corporation, San Jose, Calif.
Filed June 20, 1972, Ser. No. 264,515
Int. Cl. E05b *9/10, 17/04, 27/06*
U.S. Cl. 70—358 **9 Claims**

A rotary cylinder lock assembly is disclosed which includes a plug having radially extending passages, which plug is rotatably mounted within a cylindrical housing having like passages which are adapted to be aligned with the passages in the plug upon rotation thereof. Spring-biased driver tumbler pins are disposed in the passages in the housing and engage follower tumbler pins disposed in the passages in the plug upon alignment therewith. The follower tumbler pins are conically shaped at their outer ends and are staggered along the plug and extend into a key-receiving slot extending longitudinally of the plug. The conically shaped ends of some of the pins engage the opposite wall of the slot when the key is not in the slot.



3,777,521
TUMBLER PLATE LOCK
Paul Lipschutz, Croissy-sur-Siene, France, assignor to Societe d'Exploitation des Brevets NEIMAN, Neuilly-sur-Seine, France
Filed June 14, 1972, Ser. No. 262,878
Claims priority, application France, June 17, 1971, 7122041
Int. Cl. E05b *15/14, 29/00*
U.S. Cl. 70—364 R **4 Claims**

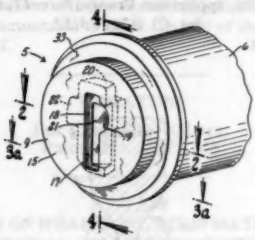


A lock wherein a flat key acts on tumbler plates, slidable in a core, to slide these several plates in one direction while an elastic biasing element or return spring, surrounding the structure, urges them in the opposite direction. The elastic element can directly contact a small boss on each tumbler plate. It urges each tumbler plate to return in the direction of the plate's axis, thereby minimizing looseness of the core and tumbler structure.

3,777,522
CLOSURE FOR CYLINDER LOCK MECHANISM
Hugo G. Rubner, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.
Filed June 12, 1972, Ser. No. 262,014
Int. Cl. E05b *17/18*
U.S. Cl. 70—455 **7 Claims**

A lock cylinder rotatable in a lock body has a cavity in its front, closed by a cap having a key aperture aligned with a keyway in the cylinder. A shutter in the cavity slides to and from a closed position blocking the key aperture, guided by a tongue on its rear received in a groove in the bottom of the

cavity. A coiled expansion spring reacting between the cavity wall and the tongue is inclined to the cylinder axis to bias the shutter forward into sealing engagement with the rear surface of the cap as well as laterally towards its closed position.

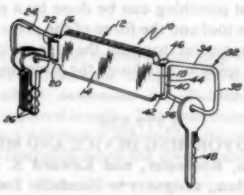


3,777,523

KEY TAG

Harold Holland, 780 Wellington Ave., Cranston, R.I.

Filed Sept. 11, 1972, Ser. No. 288,088
Int. Cl. A47g 29/10
U.S. Cl. 70—456 R 5 Claims



A key tag including a holder molded in a one-piece construction of a plastic material and having a first key ring mounted for permanent attachment on one end thereof and a second key ring removably mounted on the other end thereof, the second key ring including legs of flexing characteristics having end portions joined thereto that detachably engage the holder, the legs being flexed as required to disengage the end portions from the holder for selectively removing the second key ring from engagement with the holder.

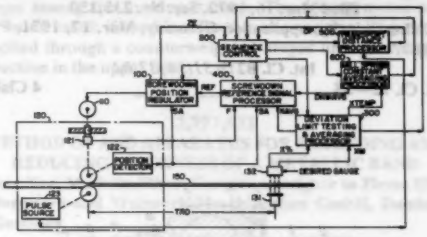
3,777,524

METHOD AND APPARATUS FOR COLD ROLLING MILL GAUGE DEVIATION CORRECTION

Robert P. Danehy; Bruce N. Kitchell, both of Williamsville, N.Y., and Antonio V. Silva, San Paulo, Brazil, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 21, 1972, Ser. No. 273,896
Int. Cl. B21b 37/00
U.S. Cl. 72—8 18 Claims

Mill spring constant change signals are produced after each of a series of screwdown regulation cycles where each change signal is produced as a function of the ratio of the gauge deviation remaining after the regulation cycle, to the change in rolling force which occurred during the regulation cycle. The series of ratio change signals are then averaged to produce a mill spring constant correction signal which is used to correct the previously established mill spring constant. The corrected mill spring constant is then used to generate a new screwdown reference signal for the next series of regulation cycles. Provision is made to limit check and average gauge deviation so that the mill spring corrections are only made when certain predetermined gauge deviation limits are exceeded.

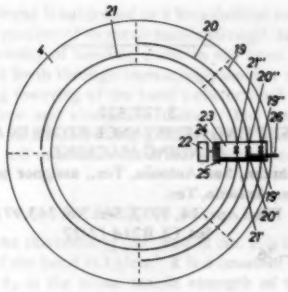


3,777,525

MACHINE FOR BENDING CONCRETE-REINFORCING BARS

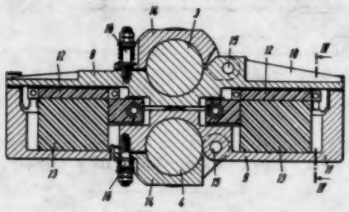
Carl Ullrich Peddinghaus, Obere Lichtenplatzer Str. 276, Wupperial-Barmen, Germany

Continuation-in-part of Ser. No. 879,428, Nov. 24, 1969, abandoned. This application Aug. 30, 1971, Ser. No. 176,078
Claims priority, application Germany, Nov. 23, 1968, P 18 10 533.4
Int. Cl. B21j 7/26
U.S. Cl. 72—22 16 Claims



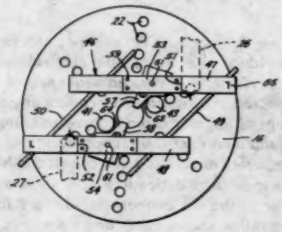
A machine for bending concrete-reinforcing bars and the like is provided with automatic electric sequence control means for performing a desired sequence of bending operations of selected predetermined bending angles. The machine has slip rings of angular extents corresponding to the selectable angles and a contact drum cooperating with these. On the drum are a series of sets of pairs of selectable contacts; each set corresponds to one bending operation and the selected contact pair in the set cooperates with a corresponding slip ring to determine the bending angle for that operation. The drum is stepwise rotated to effect the sequence of operations. To compensate for elastic relaxation of the bar after bending, the bending may be continued beyond the predetermined angle by a further angle determined by measurement of energy absorption, or current consumption, or a time interval, for bending in the elastic range of the bar material. Means for effecting such compensation automatically are described.

3,777,526
ROLLER GAP CONTROL
Peter Fink, and Ludwig Niemeyer, both of Essen, Germany, assignors to Fried Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany
Filed Mar. 16, 1972, Ser. No. 235,250
Claims priority, application Germany, Mar. 17, 1971, P 21 12 987.7
Int. Cl. B21b 31/34, 37/03
U.S. Cl. 72—35 4 Claims



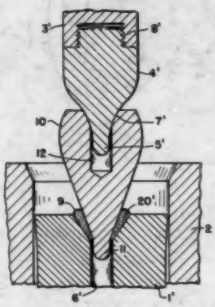
An arrangement for controlling the roller gap, especialy of multi-roller systems, in which the transmitter housing is two sectional and the housing sections are arranged on both sides of the plane through the centers of the working rollers. The primary elements are designed for the direct, e.g., inductive contact-free stroke measurement to ascertain the roller gap and are so connected to the rest of the central device, i.e., the rated-actual-comparitive stage, that the mean value of the two primary elements of one frame side represents the actual value of this frame side.

3,777,527
JIG FOR SETTING RESISTANCE STOPS IN A ROTARY BENDING MACHINE
John H. Lohman, San Antonio, Tex., assignor to Alamo Iron Works, San Antonio, Tex.
Filed Apr. 14, 1972, Ser. No. 243,971
Int. Cl. B21d 11/22
U.S. Cl. 72—36 5 Claims



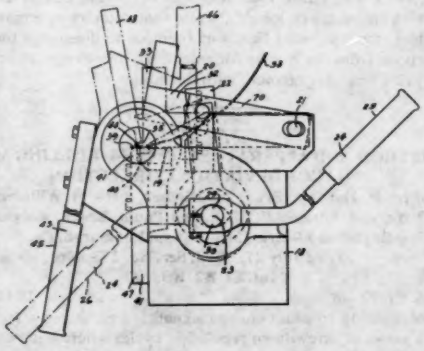
A jig for aiding in the setting of resistance stops in a rotary bending machine set up, in particular, for forming reinforcing bars with offsets as used in reinforced concrete beams.

3,777,528
METHOD OF HOT PIERCING METAL BILLETS
Albert Sirantoine, Beaumont s/Oise, France, assignor to CEFILAC, Paris, France
Filed Nov. 19, 1970, Ser. No. 91,120
Claims priority, application France, Nov. 27, 1969, 6940970
Int. Cl. B21c 23/32
U.S. Cl. 72—41 3 Claims



A billet containing an axially cold drilled cylindrical pilot hole and previously heated to deformation temperature is inserted into a hot piercing press. The pilot hole is flared at its forward end by a hot punching operation in the press itself prior to the application of the lubricant and the expansion operation. The hot punching can be done by a punching tool or by an expansion tool and the force of the press can be transmitted to the expansion tool in the expansion operation directly through a spindle or through the punching tool.

3,777,529
DUAL BEND FORMING DEVICE AND METHOD
Harold Kaufmann, Rochester, and Edward S. Lavoy, Lake City, both of Minn., assignors to Houdaille Industries, Inc., Buffalo, N.Y.
Filed Mar. 20, 1972, Ser. No. 236,025
Int. Cl. B21d 5/01
U.S. Cl. 72—57 4 Claims



A sheet forming device and method capable of providing a hooked end on a sheet with one operation, the hook having a dual bend. The device incorporates a movable forming bar which enclamps the end portion of a sheet between the form-

ing bar and a base. The forming bar has a radius bend lip projecting from it and a secondary angle die section spaced from the radius bend. The secondary angle die section overlies a urethane insert in the base. The urethane is displaced by the pressure of the forming bar against the plate sufficient to force the plate to conform with the die surface of the forming bar. A folding bar is actuatable to bend the end of the plate around the radius bend.

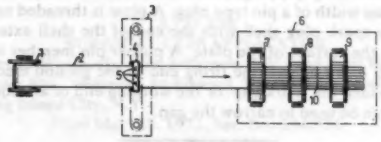
ERRATUM

For Class 72—102 see:
Patent No. 3,777,345

3,777,530
METHOD OF WEAKENING STRIP MATERIAL IN SECTION ROLLING PROCESSES

Sixten Vincent Jansson, Sleipnergatan 6, Lulea, Sweden

Filed Mar. 25, 1971, Ser. No. 127,965
Claims priority, application Sweden, Mar. 11, 1968, 3179/68
Int. Cl. B21d *13/04*; **B26d** *1/18, 1/24*
U.S. Cl. 72—129 **2 Claims**

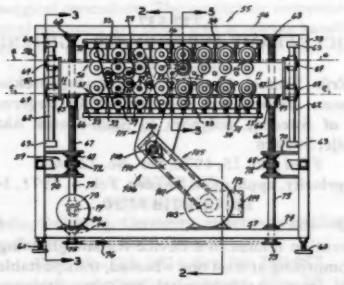


A method for section rolling metal strip in the longitudinal direction thereof, said strip being weakened prior to rolling, along lines which determine the division of the finished product into required lengths. The weakening of the strip is effected in such a way that it determines the moment during the actual rolling operation when the division shall take place.

3,777,531
DOUBLE-SPINDLED ELEVATING MULTI-STATION ROLL FORMER MACHINE AND POWER DRIVE THEREFOR

Lamont R. McClain, Mehlville, Mo., assignor to Engel Industries, Inc., Ballwin, Mo.

Filed May 25, 1972, Ser. No. 256,940
Int. Cl. B21d *5/08*
U.S. Cl. 72—181 **7 Claims**

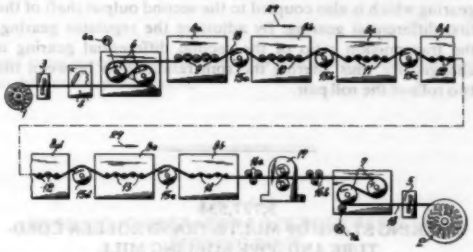


A double-spindled roll former machine, particularly useful for production line edge-forming of sheet metal duct sections, has two upper and lower forming paths, both in the same direction. An elevating mechanism brings the selected forming path into coincidence with the production line flow path. An inverted machine portion, the mirror image of the upright portion, is intergeared with it, to provide the doubled spindling and also to minimize wear and deviations in driving torque among the forming stations. The driving motor need not be elevated; if used in a fixed lower position, its power is supplied through a counterweighted hinged linkage with gear reduction in the upper link.

3,777,532
METHOD OF AND APPARATUS FOR EXTENDING AND REDUCING THICKNESS OF A METALLIC BAND

Oskar Noe, Mulheim/Rhur, Germany, assignor to Firma BWG Bergwerk-und Walzwerk-Maschinenbau GmbH, Duisburg, Germany

Filed July 7, 1972, Ser. No. 269,775
Claims priority, application Germany, July 7, 1971, P 21 34 405.8
Int. Cl. B21b *39/08*
U.S. Cl. 72—205 **11 Claims**



A metallic band is subjected to a longitudinal tension equal to at most 80 percent of its mean tensile strength as it is passed through a plurality of bending units. In the units the band is bent back and forth through increasingly smaller radii of curvature causing lowering of the band's elastic limit at the bend and plastic flow and elongation thereat. The band engages each roll over an arc preferably greater than 5° and the diameter D of each roll or of each set of roll is calculated according to the formula:

$$D = (h \cdot E)/(K \cdot k_f),$$

wherein h is the thickness of the band in cm, E is the modulus of elasticity of the band in kg/cm², K is a constant between 25 and 50, and k_f is the mean tensile strength of the band in kg/cm². The strip engages each roller over an arc which is greater than 5°, while the imaginary contact with this roller is greater than 25°.

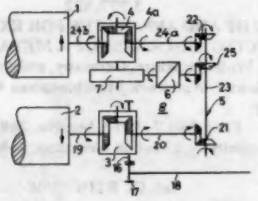
3,777,533
APPARATUS FOR STRAIGHTENING METAL BY STRETCHING

Curt Munchbach, Pforzheim-Sonnenberg, Germany, assignor to Irma Ungerer, Pforzheim-Brotzingen, Germany

Filed Oct. 20, 1972, Ser. No. 299,457
Claims priority, application Germany, Oct. 21, 1971, P 21 52 496.9
Int. Cl. B21b *39/08*; **B21d** *1/05*
U.S. Cl. 72—205 **6 Claims**

There is described a drive means in an apparatus for straightening a running metal band by exposing it simultaneously to alternating bending and to stretching by a hold-back roll assembly and a drawing roll assembly, in each roll assembly every two successive rolls form a roll pair; each roll pair is driven by a gearing group. Each gearing group is formed of a first differential gearing, a second differential

gearing and a regulator gearing. The first differential gearing has two output shafts and a compensating gear housing driven by an input shaft. One output shaft of the first differential gearing is connected directly to one roll of the roll pair, while the other output shaft is connected to the other roll of the roll pair through the second differential gearing. The compensat-



ing gear housing of the latter is connected to the regulator gearing which is also coupled to the second output shaft of the first differential gearing. By adjusting the regulator gearing, the transmission ratio of the second differential gearing is changed for thus altering the rpm relationship between the two rolls of the roll pair.

3,777,534

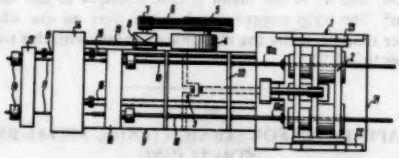
WORKING STAND OF MULTISTRAND ROLLER COLD-TUBE AND -PIPE ROLLING MILL

Vladimir Efimovich Sherman, ulitsa Vainera, 13a, kv. 14; Georgy Viktorovich Dubonosov, prospekt Ilicha, 29, kv. 6; Sergei Fedorovich Portnov, ulitsa Vainera, 13a, kv. 85; Jury Alexeevich Fedotov, ulitsa Vainera, 5a, kv. 8; Yakov Zelmanovich Grinberg, ulitsa Volodarskogo, 14, kv. 7; Nikodim Nikiforovich Soloviev, ulitsa Metallurgov, 12, kv. 4; Viktor Grigorievich Pavlov, ulitsa Lenina, 108, kv. 7, and Efim Fedorovich Dmitriev, prospekt Ilicha, 17, kv. 34, all of Pervouralsk Sverdlovskoi oblasti, U.S.S.R.

Filed June 15, 1972, Ser. No. 263,287

Int. Cl. B21b *17/06, 21/00*

U.S. Cl. 72—208 **3 Claims**



A working stand comprising a casing in which is mounted sets of working tools connected by means of a rigid joint with a slide. The casing and the slide being coupled with a drive through a leverage system effecting a reciprocating motion during which the casing moves with a higher speed and passes a larger path than the slide which results in that forming rollers of the working tool, on rolling over deform (roll down) the tubes or pipes mounted on mandrels.

The stand is designed with a view to enhancing the mill production.

3,777,535

SPARK PLUG PIN GAPPING TOOL

Wayne E. Paxton, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 27, 1972, Ser. No. 238,132

Int. Cl. B21d *26/02*

U.S. Cl. 72—293 **4 Claims**

A spark plug gapping tool is disclosed for adjusting the spark gap width of a pin type plug. A plate is threaded to position the spark plug shell with the end of the shell extending beyond the surface of the plate. A pusher pin member is provided to move against the firing end of the ground electrode pin to widen the spark gap, or the working end of an adjusting screw can be used to narrow the gap.

3,777,536

STEEL SHEET AND STRIP FOR USE IN THE MANUFACTURE OF EASY-TO-OPEN CANS

Nobuyuki Takahasi; Shuji Nagata; Toshiro Nishihara, and Kazuhiko Yoshinari, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 5, 1971, Ser. No. 195,923

Claims priority, application Japan, Nov. 10, 1970, 45/98335

Int. Cl. B21b *3/02*

U.S. Cl. 72—365 **2 Claims**

A steel sheet and strip for use in the manufacture of easy-to-open cans having excellent can opening and scoring properties, the compostiion of which is characterized by less than 0.02 percent of carbon, less than 0.1 percent of silicon, 0.1 – 0.5 percent of manganese and less than 0.03 percent of oxygen, with the remainder being iron and unavoidable impurities.

3,777,537

VEHICLE FRAME AND BODY STRAIGHTENING DEVICES

Mokjas Erik Samuel Samuelsson, Rattvik; Mokjas Jonas Samuelsson, Orebro, and Karl Johan Olov Degerman, Jarna, all of Sweden, assignors to Saab-Scania Aktiebolag, Sodertalje, Sweden

Filed Jan. 25, 1972, Ser. No. 220,602

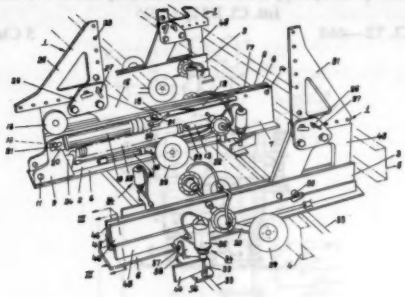
Claims priority, application Sweden, Feb. 5, 1971, 1443/71

Int. Cl. B21d *11/20*

U.S. Cl. 72—404 **5 Claims**

The invention relates to a device for straightening vehicle frames, comprising at least one wheeled, transportable unit including at least one horizontal base bar arranged to be anchored to a support surface such as a floor and provided with a longitudinally extending guide structure for at least one straightening means mounted for longitudinal movement thereon or therein. Said straightening means comprises a substantially flat base bracket structure which is mounted for

movement on one edge thereof between two vertical wall elements in the base bar. The base bracket structure is provided



on its edge surfaces with abutment surfaces and/or bearing points for cooperation with auxiliary devices connected to the base bracket structure during a straightening operation.

3,777,538

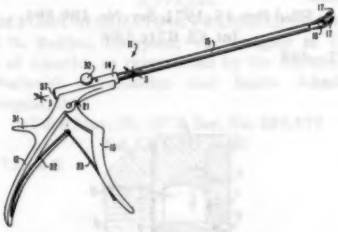
SURGICAL CLIP APPLICATOR

Gilbert L. Weatherly, Port Jefferson, N.Y., and Paul Back, St. Louis, Mo., assignors to Edward Weck & Company, Inc., Long Island City, N.Y.

Filed Mar. 15, 1972, Ser. No. 234,936

Int. Cl. B21d *9/08*

U.S. Cl. 72—410 **5 Claims**



A surgical instrument specifically constructed for the application of fluid duct strangulation clips in human body locations which were heretofore substantially inaccessible for this type of surgical procedure. The applicator comprises an elongated barrel mounted to a pistol grip actuating handle with the applicator jaws acting cooperatively at the distal end of the barrel.

3,777,539

FORGING PRESS

Fritz Priebe, Duisburg, Germany, assignor to Schloemann Aktiengesellshaft, Dusseldorf, Germany

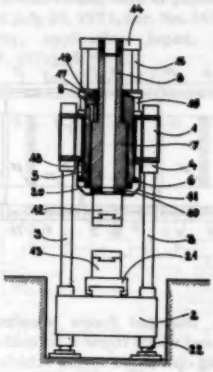
Filed Nov. 22, 1971, Ser. No. 200,957

Claims priority, application Germany, Nov. 20, 1970, P 20 56 994.2

Int. Cl. B21j *9/12*

U.S. Cl. 72—453 **3 Claims**

In order to shorten the height of a hydraulic press and to provide a reliable two-point guide, there is a fixed cross-head and the cylinder of a press ram is fixed to the cross-head; the press piston carries the forging tool and retraction means such



as a cross-piece and retraction rams act on the press piston rod to retract the press piston.

3,777,540

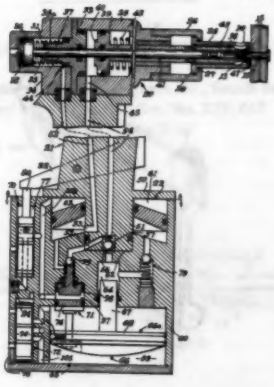
HYDRAULIC-OPERATED LOCKBOLT FASTENER SETTING TOOL

George Siebol, and Dorian E. Rippy, both of 11445 S. Dolan St., Downey, Calif.

Division of Ser. No. 876,647, Nov. 14, 1969, Pat. No. 3,680,202. This application July 26, 1972, Ser. No. 275,199

Int. Cl. B21j *15/34*

U.S. Cl. 72—391 **11 Claims**



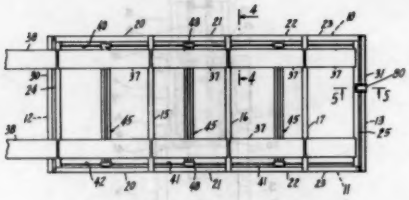
A hydro-pneumatic hand tool that is trigger-controlled to fasten a collar over the end of a headed lockbolt provided with locking grooves and a severable pintail, and then to create a predetermined clamping and swaging force on said lockbolt and collar by the use of a two-piston system, with each piston having an independent power source.

3,777,541

STRAIGHTENING APPARATUS FOR VEHICLE BODIES

Walter D. Whitney, 1420 Industrial Way, San Carlos, Calif.

Filed Oct. 4, 1971, Ser. No. 185,970
Int. Cl. B21d 1/14
U.S. Cl. 72—457 1 Claim



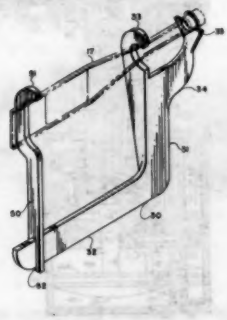
A horizontally disposed frame adapted to support a damaged vehicle and which frame is formed so as to facilitate pulling and pushing operations on the vehicle body and frame. The main portions of the frame are prestressed to provide a compressive stress in the lower fibers thereof and a tensile stress in the upper fibers so that greater upwardly directed forces on the ends of the frame may be resisted than can be resisted by a non-prestressed frame. The vehicle support is formed so as to facilitate applying pulling and pushing forces on the body and frame of the vehicle. The formation of the vehicle support also adapts it to use with various types of attachments employed to anchor the load bearing members which exert the forces on the vehicle.

3,777,542

TOOL FOR ADJUSTING TRUCK AXLE CASTER

William H. Foshee, 122 W. Pioneer, Irving, Tex., and Lester C. Jones, P.O. Box 310, Corsicana, Tex.

Filed Oct. 26, 1971, Ser. No. 192,075
Int. Cl. B21j 13/08
U.S. Cl. 72—457 4 Claims



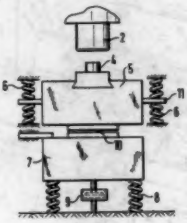
Disclosed is a tool for correcting caster in Ford twin I-beam axle assembles. The tool is primarily an L-shaped beam adapted to be detachably secured to the rear end of the radius arm and provide a base positioning an expansion device to bond the forward end of the radius arm. A strut is also disclosed to provide means for bending the forward end of the radius arm in the opposite direction.

3,777,543

FORGING MACHINE

Seppo J. Kokkola, Uudentuvantie 29B, and Veikko A. Lassila, Pohjoiskaari 43B12, both of Helsinki, Finland

Filed July 21, 1971, Ser. No. 164,605
Claims priority, application Finland, July 21, 1970, 2038/70
Int. Cl. B21j 13/06
U.S. Cl. 72—465 5 Claims



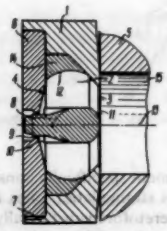
A forging machine including an anvil for supporting an object to be forged for impact by means of a dropping head. The anvil is supported by springs and an absorption means is situated below the anvil to absorb shocks thereof and prevent transmittal of vibrations to the surroundings of the machine. The absorption means is separated from the anvil by a predetermined separation and is resiliently mounted.

3,777,544

TOOL OUTFIT FOR EXTRUDING HOLLOW SHAPES

Alexandr Sergeevich Alexandrov, Vyazemskaya, 6, kv. 51, Moscow; Vadim Dmitrievich Schegolevatykh, Sadovaya ulitsa, 172, kv. 3, Kuibyshev; Vyacheslav Ivanovich Saveliev, Spartakovskaya ulitsa, 16, kv. 7, and Mikahil Fedorovich Zakharov, ulitsa Tolbukhina, 12, kv. 84, both of Moscow, all of U.S.S.R.

Filed Oct. 15, 1971, Ser. No. 189,591
Int. Cl. B21c 3/06
U.S. Cl. 72—468 2 Claims



A tool outfit with a holder enclosing a die and a splitter fastened in the holder inner cavity.

The holder inner cavity has the shape formed by rotating a curve of the second order about a geometric axis of extrusion and tapering in the direction of the holder inlet and outlet.

3,777,545

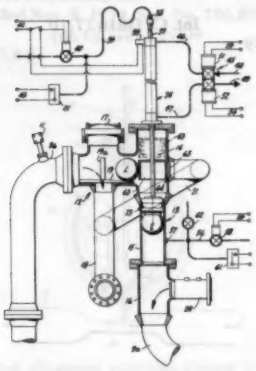
METER PROVER APPARATUS AND METHOD

Marvin H. Grove, and Tommy K. Griffin, both of Houston, Tex., assignors to M & J Valve Company, Houston, Tex.

Continuation-in-part of Ser. No. 166,727, July 28, 1971, abandoned. This application Sept. 27, 1971, Ser. No. 183,758
Int. Cl. G01f 25/00
U.S. Cl. 73—3 8 Claims

A meter prover apparatus and method making use of a metering pipe and an interchange connecting the ends of the

pipe. The interchange is characterized by use of a piston-like plunger which fits into a sleeve or barrel interposed in the interchange. Spheres are successively moved through the sleeve and launched into the metering pipe by reciprocation of the plunger. During a meter proving run the plunger is within the



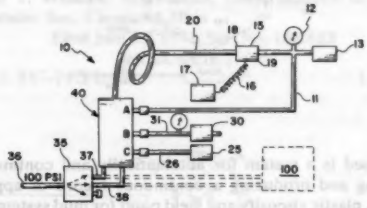
barrel and forms an interchange seal. Means can be provided to detect any leakage of liquid past the plunger seal, and also past a sphere which is adjacent to the plunger. In one embodiment the apparatus is arranged with an electrical system for automatic cycling.

3,777,546

SYSTEM FOR CALIBRATING PRESSURE TRANSDUCER

Garland N. Rollins, Hampton, Va., assignor to The United States of America as represented by the Administration of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 30, 1972, Ser. No. 239,577
Int. Cl. G01l 27/00
U.S. Cl. 73—4 R 16 Claims



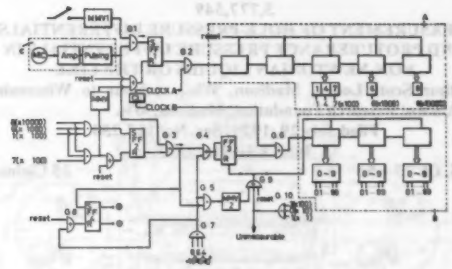
A system for calibrating a pressure transducer which has a reference portion and an active portion. A miniature selector valve is positioned immediately adjacent the pressure transducer. A reference pressure, known pressure and unknown pressure can be selectively admitted to the active side of the pressure transducer by the selector valve to enable calibration of the transducer. A valve admits pressure to the selector valve which has a piston and floating piston arrangement which allows proper selection with very small linear movement.

3,777,547

TIME RATE MEASURING SYSTEM FOR CLOCKS AND WATCHES

Takashi Izumi, No. 1-1-405 Takatsuka Jyutaku, 123-3, Takatsuka Shinden, Matsudo-shi, and Ryoji Arai, c/o Fuji Denshi Kohgyo Company Ltd., Dokushinryo No. 15-3 3-chome, Ohsu, Ichikawa-shi, both of Japan

Filed July 20, 1971, Ser. No. 165,422
Claims priority, application Japan, July 20, 1970, 45/64205; June 5, 1971, 46/39642
Int. Cl. G04d 7/12
U.S. Cl. 73—6 10 Claims



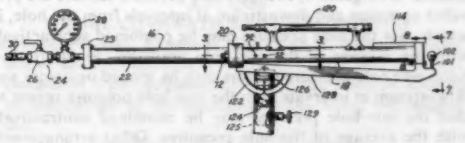
A digital time rate measuring system for clocks and watches, in which a time interval beginning from a start clock sound emanating from the time piece being measured and extending until the Nth clock sound thereafter, is compared with an accurate reference time interval. The reference time interval is in the form of a series of standard clock pulses including a reference clock pulse representing the end of said reference time interval. The direction of the time rate is determined based on whether said stop clock sound is leading or lagging said reference clock pulse, and the absolute value of the time rate is determined by counting the number of said clock pulses between said stop clock sound and said reference clock pulse. The oscillating frequency of a clock may be divided in the measuring system so as to suit the measurement.

3,777,548

GOLF BALL TESTING AND DEMONSTRATING APPARATUS

John D. Nicolaides, 3020 Buckingham Dr., South Bend, Ind.

Filed May 22, 1972, Ser. No. 255,435
Int. Cl. G01n 3/30
U.S. Cl. 73—12 17 Claims



A golf ball testing and demonstrating apparatus in which a projectile having a ball striking forward face thereon is propelled through the barrel by pressurized gas released from a chamber at the breech end of the barrel. The gas is preferably retained in the chamber at the breech end of the barrel by a diaphragm, and a means is provided at the breech

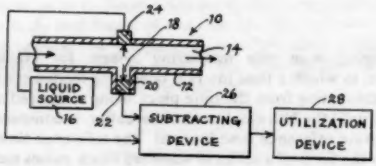
end of the barrel for piercing the diaphragm when the apparatus is to be operated, thereby instantaneously releasing the gas and propelling the projectile forwardly to strike a golf ball positioned at the muzzle end of the barrel. The barrel may be rotated and adjusted at vertical and horizontal angles to obtain variations in the flight pattern of the golf ball propelled by the apparatus. Further, the projectile face angle may also be rotated at various vertical and side angles in order to obtain variations in the flight pattern of the golf ball for producing hook, slice, fade, drop and push and other conditions normally encountered in playing golf.

3,777,549

MEASUREMENT OF HOLE PRESSURE DIFFERENTIALS AND PROTUBERANCE PRESSURE DIFFERENTIALS IN NON-NEWTONIAN LIQUIDS OR THE LIKE

Arthur Scott Lodge, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed July 29, 1971, Ser. No. 167,254
Int. Cl. G01n *11/00*
U.S. Cl. 73—53 **35 Claims**



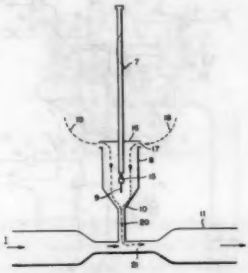
The hole pressure differential is measured by providing at least one hole in a wall along which the liquid is caused to flow. The wall may constitute a portion of a passage, reaction vessel or the like. A pressure transducer or sensor is recessed into the hole to measure the hole pressure therein. At least one non-hole pressure transducer is also provided to measure the non-hole pressure along the wall. The hole pressure and the non-hole pressure, as measured, are combined subtractively, or otherwise, so as to derive the difference between the non-hole pressure and the hole pressure at a particular location along the wall. The non-hole pressure sensor may be located opposite the hole at a point where the non-hole pressure is the same as it would be at the location of the hole. In another arrangement, two non-hole pressure sensors are provided upstream and downstream at intervals from the hole, in which case the hole pressure may be combined subtractively with the average of the non-hole pressures. Similarly, two holes and hole pressure sensors may be spaced upstream and downstream at intervals from the non-hole pressure sensor so that the non-hole pressure may be combined subtractively with the average of the hole pressures. Other arrangements may utilize a sequence of two non-hole pressure sensors and one hole pressure sensor with subtractive combining means to derive the differential hole pressure. Alternatively, two hole pressure sensors and one non-hole pressure sensor may be arranged in sequence. Similar arrangements may be employed to measure the protuberance or negative-hole pressure differentials, by replacing the holes and hole pressure transducers with protuberances and protuberance pressure transducers.

3,777,550

CONTINUOUS MEASUREMENT OF VISCOSITY

Ernst Kleinschmidt, Schildgen, Germany, assignor to Herbol-Werke Herbig-Haarhaus Aktiengesellschaft, Land Nordrhein-Westfalen, Germany

Filed Oct. 8, 1971, Ser. No. 187,698
Claims priority, application Germany, Oct. 8, 1970, P 20 49 381.6
Int. Cl. G01n *11/10*
U.S. Cl. 73—59 **3 Claims**



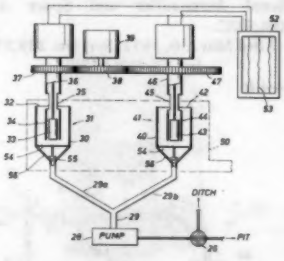
A viscometer is provided which operates on the principle of an oscillating or vibrating tongue or reed and includes means for bringing the surrounding liquid to be measured into laminar flow in the vicinity of the tongue.

3,777,551

CONTINUOUS RECORDING VISCOMETER

Walter J. Weiss, Sugarland, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 20, 1971, Ser. No. 209,874
Int. Cl. G01n *11/10*
U.S. Cl. 73—59 **6 Claims**



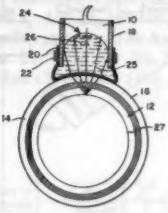
Disclosed is a system for automatically and continuously measuring and producing a continuous record of apparent viscosity, plastic viscosity and yield point for mud systems during a well drilling operation. Also, a continuous record of the ratio of plastic viscosity to yield point values is obtained by the system. Two viscosity determining units are synchronized relative to one another so that their outputs may be used and combined to obtain the above mentioned parameters. Each unit is comprised of a type of Fann viscometer having a sampling cup with a bottom inlet and an open top where overflow may occur. The speed of rotating cylinders in the respective sampling cups, synchronized relative to one another so that when one viscometer operates at 300 rpm the other viscometer operates at 600 rpm, and the outputs of the viscometers can be electronically combined to yield apparent viscosity, plastic viscosity and yield point, as well as the plastic viscosity-yield point ratio.

3,777,552

ULTRASONIC SCANNING SYSTEM FOR IN-PLACE INSPECTION OF BRAZED TUBE JOINTS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Johnny L. Haynes; Charles G. Wages, and Hamilton S. Haralson, all of Huntsville, Ala.

Filed Nov. 9, 1971, Ser. No. 196,898
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.8 S **5 Claims**



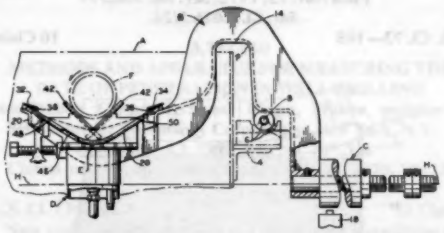
A miniaturized ultrasonic scanning system for non-destructive in-place, non-immersion testing of brazed joints in stainless-steel tubing. The system is capable of scanning brazed tube joints, with limited clearance access, in 1/4 through 5/8 inch union, tee, elbow and cross configurations. The system has the capability to detect defective conditions now associated with material density changes in addition to those which are dependent upon density variations. The system includes a miniaturized scanning head assembly that fits around a tube joint and rotates the transducer around and down the joint in a continuous spiral motion. The transducer is 0.300 inch diameter focused beam type with a liquid filled rubber tip or boot attached, which provides a simulated immersion test. The scanning head incorporates suitable mechanical drive features, limit switches to control scan travel, and a transmitter to synchronize a facsimile C-scan recorder with the scanning movement. The C-scan recorder is similar in principle to conventional models except that it was specially designed to track the continuous spiral scan of the tube joint. The scanner and recorder can be operated with most commercially available ultrasonic flaw detectors.

3,777,553

SUPPORT FOR TEST HEAD

Joseph T. Wloszek, Seven Hills, Ohio, assignor to Custom Machine, Inc., Cleveland, Ohio

Filed Jan. 22, 1971, Ser. No. 108,853
Int. Cl. G01n *29/00*
U.S. Cl. 73—71.5 U **13 Claims**



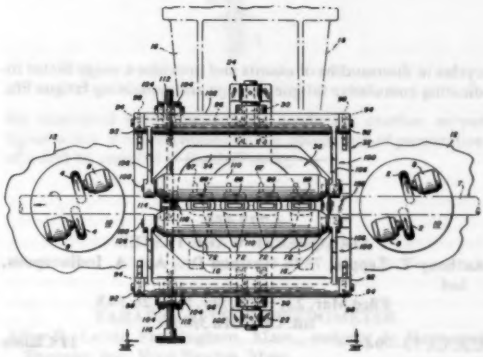
A mounting for the sensing head of a precision testing machine which enables the head to freely move and orient itself relative to the surface of a workpiece. Spaced parallel lengths of an elongated elastic member are fastened at the ends to a supporting frame. The head in engagement with the workpiece is cradled between the middle portions of the elastic members and can move freely up, down, or laterally in both horizontal directions.

3,777,554

ULTRASONIC TESTING APPARATUS

Charles J. Papay, Calumet City, Ill., and Ralph A. Settle, Gary, Ind., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed May 27, 1969, Ser. No. 828,313
Int. Cl. G01n *29/04*
U.S. Cl. 73—71.5 U **9 Claims**



Apparatus for ultrasonically testing a tube includes means for rotating the tube and feeding it axially, a carriage located below the path of travel of the workpiece, and a plurality of vertical bubbler heads arranged side by side on the carriage so that different circumferential portions of the tube are tested as the tube passes the successive bubbler heads. The carriage also carries a pair of rolls which rest on top of the tube being tested to support the bubbler heads in the correct position. Each bubbler head includes a hollow aluminum body member, a sound wave transmitting plate attached to the bottom of the body member, and a rubber member attached to the top of the body member with a liquid outlet at its top. A crystal is attached to the bottom of the sound wave transmitting plate and water is fed to the side of the bubbler head so that the crystal is kept out of contact with the water.

3,777,555

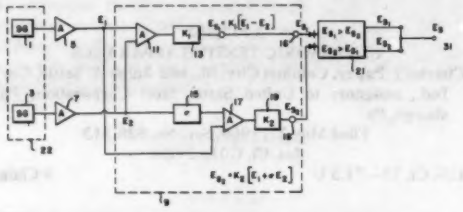
CUMULATIVE FATIGUE LIFE INDICATOR

Edwin M. Petrisko, Annapolis, Md.; Karl H. Keller, deceased, late of Arnold, Md., and by Penny C. Keller, administratrix, Oceanside, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 3, 1972, Ser. No. 249,835
Int. Cl. G01n *3/32*
U.S. Cl. 73—91 **5 Claims**

The purpose of this invention is accumulation and display of information indicative of expended and remaining fatigue life of a test specimen or pressure vessel. Strain-gauge output signals are amplified by a dual channel conditioning circuit. The dual channel bipolar strain signals are then used to compute the alternating stress range absolute value on a continuous basis. Voltage signals proportional to the alternating stress

are then presented to a counter which registers the individual accumulated stress cycles with reference to the total allowable



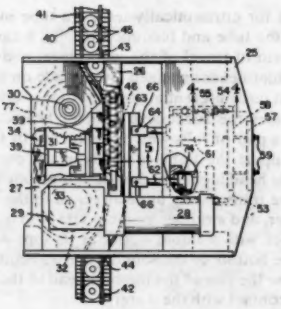
cycles in thousandths of counts and provides a usage factor indicating cumulative fatigue damage and remaining fatigue life.

3,777,556

AIR SQUEEZE WARE TESTER

Anthony T. Zappia, 7576 Ivywood Dr., Apt. A, Indianapolis, Ind.

Filed Mar. 22, 1971, Ser. No. 126,543
Int. Cl. G01n *3/00*
U.S. Cl. 73—94 **21 Claims**



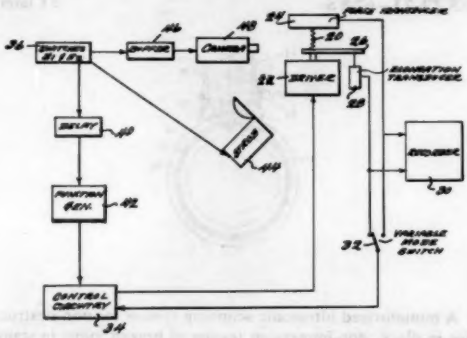
Apparatus for impressing a transaxial crushing force of predetermined value successively upon a series of substantially identical pieces of frangible ware for the purpose of discarding pieces of defective strength, including a pneumatically loaded presser head in opposed registration with a vertically disposed face of a conveyor or impeller, the same being so disposed that pieces of ware, while being subjected to transaxial pressure, are supported in unstable condition upon a moving platform so that, upon fracture of a piece of ware, substantially all fragments of such piece will fall from the platform, means being provided for cooperation with the upper regions of undamaged ware to support such ware against toppling from the platform. The active face of the presser head is formed of synthetic material, that portion thereof below a level at least equal to the transaxial dimension of a piece of ware above the platform having a coefficient of friction significantly less than that of the portion of the face above that level to facilitate the free movement of a prostrate ware piece past the presser head.

3,777,557

STRAND TESTER

Frederick A. Dunlap, Greensboro, N.C., and Lyle C. Wilcox, Clemson, S.C., assignors to Greenwood Mills Corporation, Greenwood, S.C.

Filed Nov. 5, 1971, Ser. No. 196,069
Int. Cl. G01n *3/08*
U.S. Cl. 73—95 **25 Claims**



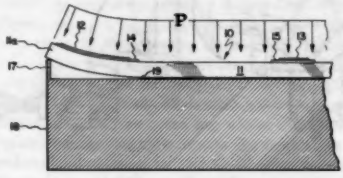
An apparatus for testing strands of yarn or the like whereby the yarn is attached to a unique driver which exerts a force on and elongates the yarn in accordance with an input force signal. The elongation and force applied are each respectively detected and a signal indicating each generated. A manually operated switch has a first position connecting the force signal to an operational amplifier which also receives a programming signal from a function generator so as to produce a force signal which varies the force applied in accordance with a preset force program, for example, to keep the rate of force increase constant, and a second position connecting the elongation signal to the operational amplifier together with the programming signal so as to produce an elongation signal which varies the elongation applied in accordance with a preset elongation program. A camera having a drive motor for driving film through the camera is also preferably mounted for photographing the strand during the test. A manual switch is operated to apply a voltage to the drive motor through a circuit which increases the voltage at a rate so as to accelerate the film gradually and avoid tearing and also to apply a signal through a delay circuit which enables the function generator after the camera is functioning.

3,777,558

STRAIN-LEAF BURR HEIGHT DETECTOR

James A. Bain, Erie, Pa., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 15, 1972, Ser. No. 306,599
Int. Cl. G01b *5/28*
U.S. Cl. 73—105 **10 Claims**



A burr height detector includes a thin flexible strain leaf with an active strain gage located close to an end of the strain

leaf. The strain leaf is pressed into engagement with a burr and adjacent workpiece surface and flexes to apply variable strain to the active strain gage depending on burr height. The change in strain gage resistance is measured by a resistance bridge. An array of burr height detectors on a pressure head can be provided.

3,777,559

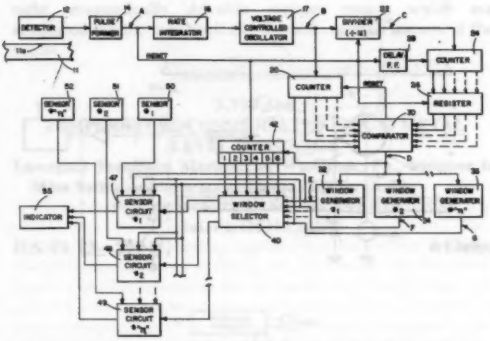
SYSTEM FOR ANALYZING ENGINE PERFORMANCE

Lyle V. Rennick, Mission Viejo, Calif.; John D. Shore, Oconto, Wis.; William L. Mitchael, Fullerton, Calif.; Ronald B. Weiss, and Clarence L. Almich, both of Anaheim, Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Apr. 21, 1972, Ser. No. 246,142

Int. Cl. G01m *15/00*

U.S. Cl. 73—117.3 **10 Claims**



A first counter is driven by pulses from a signal generator. A second counter is driven by the output of the signal generator divider by a factor in accordance with the number of cylinders in the engine under test. The output of the second counter is shifted to a register in response to a pulse which is phase synchronized with a predetermined point in the rotation cycle of the engine. The output of the register and the output of the first counter are compared for coincidence, a coincidence signal being generated which corresponds to a predetermined point in the cycle of each of the engine cylinders. These coincidence signals are used to generate window signals which provide gating signals to sensor circuits. The sensor circuits receive the outputs of sensors which provide electrical signals in accordance with various engine parameters. The outputs of the sensor circuits are gated to an indicator by the window signals so that the sensed parameters can be observed at predetermined identifiable portions of each engine rotation cycle.

3,777,560

METHODS AND APPARATUS FOR MEASURING THE RATE OF PENETRATION IN WELL DRILLING

Jean-Hubert Guignard, Sainte Mesne, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

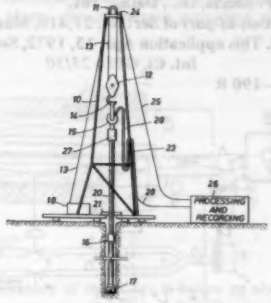
Filed Dec. 13, 1971, Ser. No. 207,326

Claims priority, application France, Dec. 30, 1970, 7047214

Int. Cl. E21b *45/00*

U.S. Cl. 73—151.5 **22 Claims**

New and improved methods and apparatus exemplifying the present invention are disclosed herein for measuring at the surface the changes in total elongation of a drill string due to variations in the tensional forces acting thereon during a typical well drilling operation, measuring the changes in the total length of the drill string as it is moved into and out of the borehole at the surface, and uniquely combining these measurements for producing an output signal which is representative of the changes in the borehole depth as well as converting



the combined measurements for producing another output signal which is representative of the actual rate of penetration of a drill bit coupled to the drill string.

3,777,561

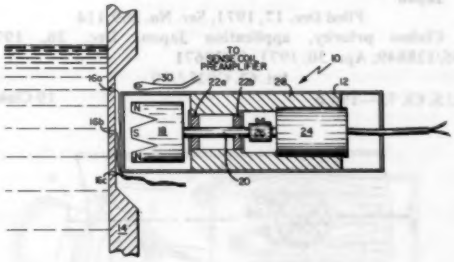
FARADAY EFFECT SPEEDOMETER

John R. Lewis, Framingham, Mass., assignor to Harnessed Energies, Inc., West Newton, Mass.

Filed Feb. 3, 1972, Ser. No. 223,119

Int. Cl. G01p *5/08*

U.S. Cl. 73—181 **19 Claims**



A speedometer employing the Faraday Effect principle which includes a magnet having two sets of alternating north and south poles disposed in a housing and adapted for rotation therein to provide an alternating magnetic field. The housing is disposed adjacent the wall of a vessel such that the magnetic field extends through the vessel wall and into the fluid on the other side of the vessel wall. Electrodes are disposed in the wall of the vessel and in the magnetic field. A sense coil is disposed external to the housing and sealed from the fluid such that the sense coil is responsive to the alternating magnetic field and provides a switching waveform. The flow of fluid across the outer wall of the vessel on its movement changes the potential across the electrodes and a corresponding signal is provided. The signals from the sense coil and the electrodes are combined to yield a signal corresponding to the speed of the vessel.

3,777,562

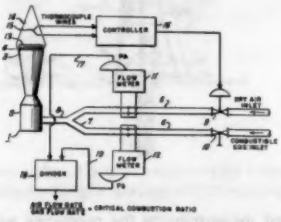
METHODS OF AND MEANS FOR DETERMINING THE CALORIFIC VALUE OF COMBUSTIBLE GASES

William H. Clingman, Jr., Dallas, Tex., assignor to Precision Machine Products, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 21,410, March 20, 1970, abandoned. This application Apr. 13, 1972, Ser. No. 243,595

Int. Cl. G01n 25/30

U.S. Cl. 73—190 R 42 Claims



Methods of and means for measuring the calorific value of combustible gases wherein a mixture of a combustible gas and a combustion-supporting gas is burned in one or more flames, the temperature or temperatures of the burned gases being monitored and the volume ratio of the combustion-supporting gas to the combustible gas being adjusted so as to maintain said temperature or the average of said temperatures at substantially maximum; the volume ratio of said gases which produces said maximum temperature varying substantially directly with the calorific value of said combustible gas.

3,777,563

FLOW-VELOCITY DETECTING DEVICE

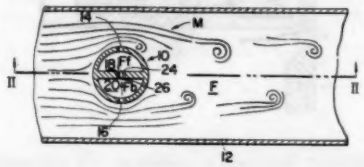
Hiroo Yamasaki; Yoshio Kurita, and Ichizo Ito, all of Tokyo, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed Dec. 17, 1971, Ser. No. 209,114

Claims priority, application Japan, Dec. 26, 1970, 45/128849; Apr. 30, 1971, 46/28671

Int. Cl. G01f 1/00

U.S. Cl. 73—194 B 19 Claims



Flow metering apparatus of the type wherein a vortex generating element having a generally elongate cylindrical shape is placed transversely in a stream of fluid to produce on opposite sides of the element vortices which are shed in alternating fashion, and wherein the element is formed with openings at said opposite sides which are connected together through the interior of said element to produce therein an alternating fluid flow corresponding to the alternating shedding of vortices. To improve the sensitivity of detection of the alternating flow, especially at low velocities accompanied by substantial noise, the apparatus is provided with directionally sensitive flow detection means in the alternating flow, arranged to be responsive predominantly in a direction aligned with the direction of the alternating flow. The directionally sensitive flow detection means is formed: by a heated resistance wire having a nonuniform coating therearound to vary heat transfer according to the direction of flow thereagainst; by a flow detector within an interior passageway arranged to have different flow resistances according to the direction of flow; or by flow diversion means positioned upstream of a flow detector to guide flow therearound for one direction of alternating flow, the opposite direction of flow being free to impinge upon the detector.

3,777,564

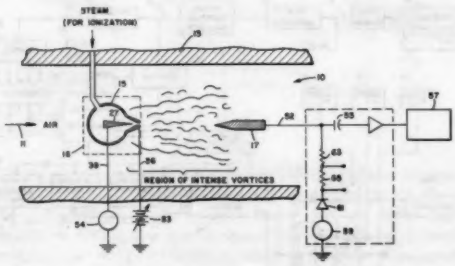
ELECTROGASDYNAMIC SPECTRAL ANEMOMETER

Oscar Biblarz, Monterey, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 27, 1971, Ser. No. 212,243

Int. Cl. G01f 1/00; G10n 27/62

U.S. Cl. 73—194 F 8 Claims



An electrogasdynamic spectral anemometer including a particle injector and a particle collector that are inserted into a turbulent fluid stream that is under investigation. The injector includes a hollow cylinder into which near saturated steam from an outside source is introduced. The injector also includes a nozzle, a corona needle and an attractor ring which are oppositely charged and located within the nozzle. As the steam passes through the nozzle it supersaturates and condenses into droplets having a size that is primarily determined by the condition of the incoming steam. The droplets are then charged through the corona developed between the corona needle and the attractor ring. Then the charged droplets are ejected from the nozzle and into the stream to be measured where they follow its rapid fluctuations. These charged particles move towards the collector which may be placed downstream of the injector. When a charged particle passes the collector it becomes neutralized and transmits an electrical signal into collector circuitry where it is analyzed to provide information about the intensity of the turbulence at various frequencies. Different droplet sizes are used for different turbulent frequencies of interest depending on the maximum value of the frequency present in the flow.

3,777,565

MAGNETIC CONVERTER FOR WATER METERS

Ronald A. Munier, New Providence, and Charles Che Ling, Newark, both of N.J., assignors to Gamon-Calmet Industries, Inc., Newark, N.J.

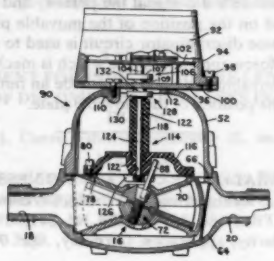
Filed Aug. 3, 1972, Ser. No. 277,863

Int. Cl. G01f 3/08

U.S. Cl. 73—258 1 Claim

Conversion means are provided to enable the ready conversion of mechanically coupled water meters to magnetically coupled operation, and include magnetic drive means, and

bearing and support means therefor, which are substituted for the mechanical coupling of the meter, and substantially fluid



tight, magnetically drivable register means which are sustituted for the mechanically drivable register means of the meter.

3,777,566

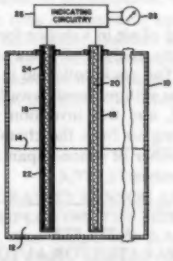
TEMPERATURE COMPENSATED LIQUID METAL LEVEL INDICATOR

Lawrence Francisco Marinaccio, Wampum, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Oct. 16, 1972, Ser. No. 297,875

Int. Cl. G01f *23/26*

U.S. Cl. 73—290 R **6 Claims**



A liquid metal level indicator of the type in which the inductance of a reference coil is compared in a bridge circuit with that of an active coil whose lines of flux intersect a metal bath, and incorporating a shield of conductive material around the reference coil to compensate for variations in inductance of the reference coil due to temperature variations. Additionally, the invention resides in the provision of an indicator of the type described wherein the reference and active coils extend downwardly into a metal bath in side-by-side relationship whereby the level of the bath can be determined over a range extending from the extreme bottom of a container for the bath to the extreme top of the container.

3,777,567

TEMPERATURE MEASURING APPARATUS FOR ROTATING ROLLERS

Kunio Ohto, Matsuyama, Japan, assignor to Teijin Limited, Osaka, Japan

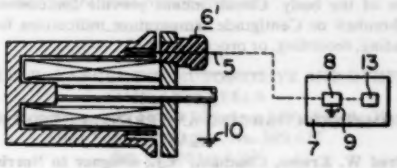
Continuation-in-part of Ser. No. 135,223, April 19, 1971, abandoned. This application Nov. 21, 1972, Ser. No. 308,305

Claims priority, application Japan, Apr. 22, 1970, 45/39271

Int. Cl. G01k *1/08*

U.S. Cl. 73—351 **8 Claims**

Apparatus for measuring the temperature of a rotating roller mounted on a frame including a temperature sensor mounted on and electrically insulated from the frame and having a tip extending within a groove in the roller without contacting the roller to provide electrical signals corresponding to the temperature of the roller, and a grounded detecting device receiving the electrical signals from the temperature sensor and having an alarm circuit therein providing alarm signals



when the temperature of the roller is below or above low and high limits, respectively. If the temperature sensor contacts the roller, a current will be produced between the frame and the detecting device ground to develop a signal overlapping the electrical signals and representing a sufficient increase or decrease in temperature of the roller received by the alarm circuit to provide an alarm signal.

3,777,568

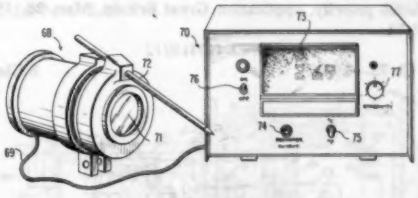
D. C. ELECTRONIC APPARATUS FOR IR RADIATION TEMPERATURE MEASUREMENT

Ojars Risgin, Grass Lake, and Donald M. Szeles, Ann Arbor, both of Mich., assignors to Sensors, Inc., Ann Arbor, Mich.

Filed Dec. 21, 1971, Ser. No. 210,463

Int. Cl. G01j *5/10;* **G06g** *7/20*

U.S. Cl. 73—355 EM **15 Claims**



Rapid response, high accuracy, D.C. electronic device for non-contact temperature measurement relying on infrared radiation viewed without use of cyclic interruption of radiation, any type of sequential operation or moving parts and without relying on any type of reference temperature main-

tenance. A temperature responsive radiation intensity signal ($T^4_{(obs)} - T_R{}^4_{(obs)}$) is produced and algebraically combined electronically with an independently sensed reference temperature (T_R) raised to the fourth power ($T_R{}^4_{(obs)}$) to produce an output signal ($T_{obs}{}^4$) functionally related to object temperature. Extracting the fourth root electronically a signal (T_{obs}) is produced which is in linear relation to the absolute temperature of the body. Circuit means provide for conversion to Fahrenheit or Centigrade temperature indications for direct reading, recording, or process control.

3,777,569

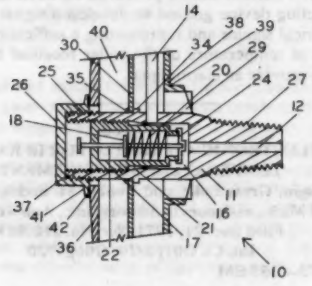
COMBINED CHARGING AND PRESSURE INDICATING DEVICE

Alfred W. Krulee, Chatham, N.J., assignor to Norris Industries, Inc., Los Angeles, Calif.

Filed June 21, 1972, Ser. No. 264,776

Int. Cl. G01l *19/00*

U.S. Cl. 73—389 **2 Claims**



A pressure gage has a charging inlet positioned in the center of the dial of the gage, in addition, the closure for the charging inlet is used for releasably making the pressure gage watertight.

3,777,570

FLUID PRESSURE TRANSDUCERS

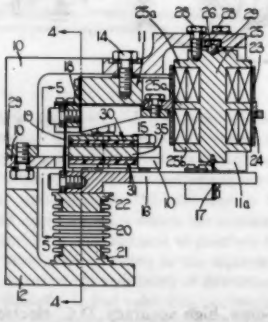
Alan Thomas, Stratford-on-Avon, and Ronald Alfred Heath, Harborne, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Mar. 22, 1972, Ser. No. 237,022

Claims priority, application Great Britain, Mar. 26, 1971, 8217/71

Int. Cl. G01l *9/12*

U.S. Cl. 73—398 C **8 Claims**



A fluid pressure transducer is disclosed, said transducer includes a differential capacitor with one plate movable by a pressure sensing device. This capacitor is part of a resonant radio frequency a.c. bridge circuit, which produces an a.c. signal, and dependent on the displacement of the movable plate. A phase discriminator circuit is coupled to the bridge circuit to produce a d.c. signal the polarity and magnitude of which depend on the position of the movable plate. The output of the phase discriminator circuit is used to drive an electromagnetic force applying device which is mechanically coupled to the movable plate and to provide an output signal dependent on the position of the movable plate.

3,777,571

EXHALED AIR COLLECTING VESSEL

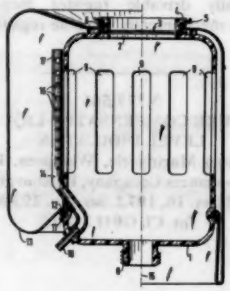
Erich Jaeger, 5 Rontgenring, Wurzburg, Germany

Filed Apr. 7, 1972, Ser. No. 241,989

Claims priority, application Germany, Apr. 7, 1971, G 71 13 512.1

Int. Cl. G01n *1/22*

U.S. Cl. 73—421.5 **6 Claims**



Improved sampling of air in a device for collecting exhaled air, for example in the analysis of gases exhaled by a person under examination. The gas is collected in a chamber defined by an inner container with perforated walls surrounded by an outer inflatable bag, and this invention provides improved sampling by extracting air from the chamber through an extension having a number of spaced apart air entry apertures leading into said chamber.

3,777,572

METHOD AND APPARATUS FOR AUTOMATIC SAMPLE LOADING FOR CHROMATOGRAPHY COLUMNS

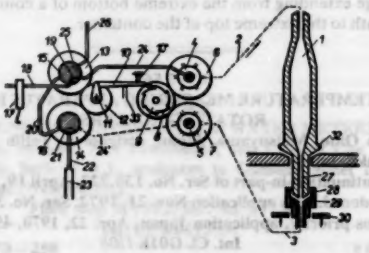
Jiri Hrdina, Prague, Czechoslovakia, assignor to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Continuation of Ser. No. 458,081, May 24, 1965, abandoned. This application July 11, 1968, Ser. No. 747,006

Claims priority, application Italy, Aug. 3, 1971, 69610 A/71 3161/64

Int. Cl. G01n *1/28*

U.S. Cl. 73—422 GC **15 Claims**



A device for metering successive samples in to the input of a chromatography column. A device including plurality of sam-

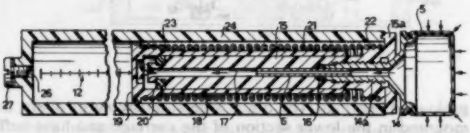
ple receptacles, each of which can be loaded in advance, is connected by means of hydraulic switching means to a pump and the column. The hydraulic switching means can either connect the pump directly to the column or direct eluent from the pump through receptacles and then to the column.

3,777,573

INSTRUMENT FOR INDICATING THE LENGTH AND NUMBER OF DECOMPRESSION PAUSES IN UNDERSEA DIVING

Carlo Alinari, Corso Vittorio Emanuele II, no. 200, Turin, Italy

Filed June 28, 1972, Ser. No. 266,917
Claims priority, application Italy, Aug. 3, 1971, 69610 A/71
Int. Cl. G01f *23/14*
U.S. Cl. 73—432 R **1 Claim**



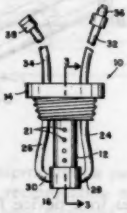
An instrument for indicating the decompression pauses to be observed by an ascending diver, and the duration of these pauses, is according to this invention provided with a deformable chamber subjected to the ambient pressure and filled with liquid, this chamber communicating via a calibrated tube with a spring-loaded hydraulic accumulator, so that the liquid displaced through the tube is dependent upon the ambient pressure acting on the deformable chamber and the spring loading of the accumulator. An indicator is connected to the hydraulic accumulator to indicate on a graduated scale the pressure in said accumulator and therefore the volume of liquid displaced through the tube.

3,777,574

SPECIFIC GRAVITY SENSOR AND A SYSTEM EMPLOYING THE SENSOR

Daniel M. Brown, San Diego, and John D. Isaacs, Rancho Santa Fe, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Jan. 4, 1971, Ser. No. 103,623
Int. Cl. G01n *9/10*
U.S. Cl. 73—453 **15 Claims**



A specific gravity sensor that is disposed in a liquid, the sensor including at least one pair of vertically extending, light-transmitting elements, one of the elements of the pair having a light-emitting portion submerged in the liquid, which portion is spaced from a confronting light-receiving portion of the other element. Each element has a portion that extends above the liquid and one of those latter portions is subjected to light. A light-flow inhibitor is guided vertically to move upwardly and downwardly between those submerged portions of those elements depending upon the variations in the specific gravity of the liquid and the inhibitor thereby functions to permit and prevent, respectively, the transmission of light therebetween.

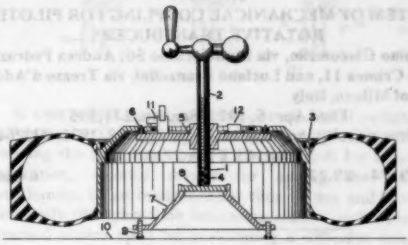
The sensor can be employed in a system for controlling mechanism by picking up light rays that emanate from the light-receiving light-transmitting element.

3,777,575

STATIC BALANCER FOR AUTOMOTIVE AND OTHER SIMILAR WHEELS

Louis P. C. Smithmeyer, 12009 30th Ave. S.W., Seattle, Wash.

Filed Apr. 3, 1972, Ser. No. 240,627
Int. Cl. G01m *1/12*
U.S. Cl. 73—483 **5 Claims**



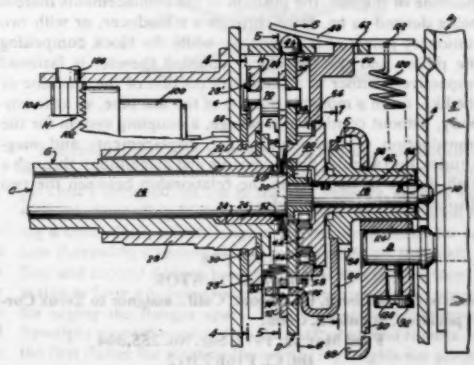
Centering points on a plate are inserted into the stud holes of a wheel from the inside of the wheel and the plate is locked onto the wheel. The wheel is rolled into a position adjacent a pedestal and is laid down on its side over the pedestal. A balancing rod carried by the plate is then lowered down onto the pedestal to raise the wheel into a position of support on the balancing rod.

3,777,576

COMPACT TV TUNER

Carroll R. Miner, Wilbraham, Mass., assignor to General Instrument Corporation, Newark, N.J.

Filed Jan. 23, 1973, Ser. No. 326,147
Int. Cl. H03j *1/08, 1/14*
U.S. Cl. 74—10.29 **19 Claims**



In a tuner for tuning a TV receiver or the like to a selected one of a plurality of predetermined frequencies or channels, a detent element is interposed between the main tuning shaft

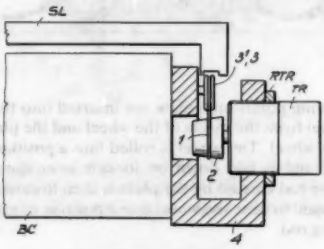
and the tuning element per se, planetary gearing drives the detent element from the main tuning shaft, gearing drives the control shaft of the tuning element from the detent element, the detent element carries fine tuning parts, and all of these cooperating members are securely and reliably assembled and mounted for long life and easy operation. The detent element and the gear connecting it to the control shaft of the tuning element are provided with elongated extensions which rotatably mount the respective parts, those extensions in turn being supported by a portion of the main tuning shaft. The detent element is itself recessed in order to receive certain of the driving gears, including at least part of the planetary gearing. Actuation of the fine tuning member carried by the detent element is accomplished by means of an axially extending cam mounted on a rotatable fine tuning element. Compactness of design is therefore achieved without sacrifice of sturdiness or reliability.

3,777,577

SYSTEM OF MECHANICAL COUPLING FOR PILOTING ROTATIVE TRANSDUCERS

Giacomo Giacomello, via Domenichino 50; Andrea Pedrazzini, via Crimea 11, and Luciano Franzolini, via Trezzo d'Adda 8, all of Milano, Italy

Filed Apr. 6, 1972, Ser. No. 241,595
Claims priority, application Italy, Apr. 15, 1971, 932264/71
Int. Cl. F16h *27/02*
U.S. Cl. 74—89.22 **6 Claims**



A system of mechanical coupling comprising as essential members: a smooth tape, slipping, and a rotary pinion having a smooth surface, on which the tape is wrapped through an arc of less than 360°, the tape having a rectangular cross section with a surface area smaller than 1 square millimeter and a breadth which is within the range of 10 to 20 times the thickness, and the pinion having a diameter as great as hundred times the thickness of the tape, the ends of the tape being connected either to the ends of the movable member of a machine or the like, the position or the displacements thereof being desired to be noted through a transducer, or with two stationary points of the machine, while the block comprising the pinion and the transducer coupled thereto, is fastened respectively, either to a stationary portion of the machine or the like, or on a movable portion of the machine, so as to embody, without continuity breakage, a coupling system for the transduction of linear and polar displacements and magnitudes, into angular displacements and magnitudes, through a high degree of linearity in the relationship between the two displacements or magnitudes.

3,777,578

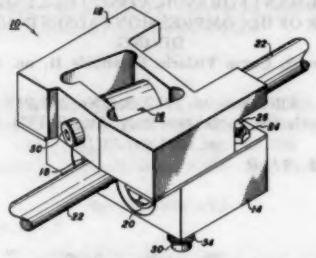
LINEAR ACTUATOR

Melvin E. Swanberg, Claremont, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 22, 1972, Ser. No. 255,364
Int. Cl. F16h *25/12*
U.S. Cl. 74—89 **2 Claims**

A linear actuator for converting rotary motion into rectilinear motion which includes a plurality of rollers mounted in a two section carriage and supported thereby for engagement with a drive shaft, the axes of the plurality of rollers being disposed at an angle relative to the drive shaft axis whereby the frictional contact therewith causes rectilinear motion of the carriage upon the rotation of the drive shaft.

The upper section of the carriage includes a precision mounted roller maintained at an inclined angle to the shaft by



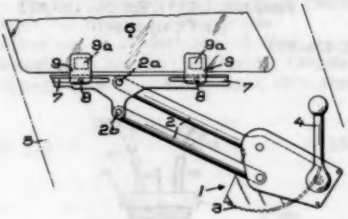
preloaded bearings. The other rollers, or pressure rollers, are mounted in the lower section of the carriage and have sufficient moment freedom to self-align to the angle dictated by the precision roller. The pressure rollers, in a preferred embodiment, are crowned to their own diameter.

3,777,579

DEVICES FOR RAISING AND LOWERING A CAR DOOR WINDOW

Jean G. Cadiou, Saint-Cloud, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Jan. 19, 1972, Ser. No. 219,089
Claims priority, application France, Jan. 26, 1971, 7102551
Int. Cl. F16h *21/44*
U.S. Cl. 74—99 **8 Claims**



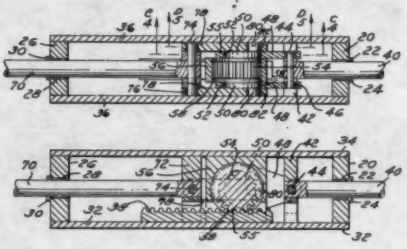
This invention relates to a device for moving a panel in translation with respect to a structure, particularly a car door window, constituted of at least two rollers engaged in at least one slideway, these rollers being integral in translation with the panel, whilst the slideway or slideways are coupled to the structure by a transmission of movement, wherein said rollers are disposed on intermediate supports, each of these rollers on an intermediate support peculiar thereto, said supports being separate from one another, and each of said supports being secured to the panel in a zone which extends only partially over the panel.

3,777,580

MOTION AND FORCE TRANSFORMING MECHANISM

John Henry Brems, 32867 White Oaks Trail, Birmingham, Mich.

Filed Sept. 30, 1971, Ser. No. 185,273
Int. Cl. F16h 21/44
U.S. Cl. 74—110 13 Claims



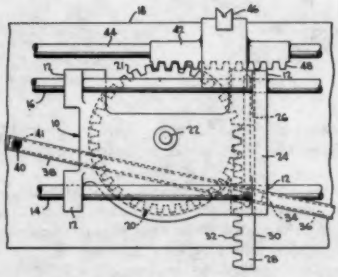
A self-contained motion and force transmitting mechanism which includes a housing having a straight line input member and a straight line output member with included mechanism to translate a constant velocity input to a desired acceleration and deceleration output with a desired constant velocity interposed between the ends of the stroke.

3,777,581

YARN GUIDE RECIPROCATING APPARATUS

Rolland Sartori, Riorges, France, assignor to Ateliers De Constructions Bourgeas-Fougeirol, Valence, France

Filed Oct. 16, 1972, Ser. No. 297,711
Claims priority, application France, Oct. 18, 1971, 7137411
Int. Cl. F16h 21/44
U.S. Cl. 74—110 10 Claims



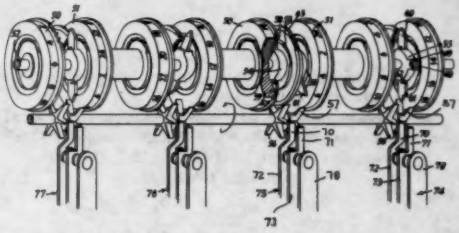
Apparatus for reciprocating a yarn guide including a carriage mounted for reciprocating movement on a frame, a pinion wheel rotatably mounted on the carriage, a rack slidably mounted on the carriage meshing with the pinion wheel and having a follower sliding in an elongate track to control movement of the rack to rotate the pinion wheel, and a rack carrying a yarn guide and meshing with the pinion wheel such that rotation of the pinion wheel moves the yarn guide with adjustment of the angular orientation of the elongate track relative to the reciprocating path of the carriage controlling the distance of reciprocating travel of the yarn guide.

3,777,582

TIME SWITCHES

Peter Robert Durdin, New Malden, England, assignor to AMF Incorporated, White Plains, N.Y.

Filed May 3, 1972, Ser. No. 249,852
Claims priority, application Great Britain, May 4, 1971, 13,064/71
Int. Cl. F16h 27/00
U.S. Cl. 74—112 12 Claims



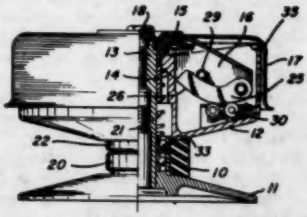
A time switch having at least one electrical switch, on and off actuators for each switch, a driven differential mechanism moving the actuators along a circular path for timed switch operation, manual means for setting the differential mechanism to an instantaneous time of day and having continuously changing time indicating means, and a plurality of manual means each for positioning a different actuator for switch operation at a predetermined time of day and having means to indicate the time of day such actuator will operate the switch.

3,777,583

CLUTCH

Jean-Guy Talbot, Valcourt, Quebec, Canada, assignor to Bombardier Limited, Valcourt, Quebec, Canada

Filed Mar. 31, 1972, Ser. No. 240,105
Claims priority, application Canada, Nov. 24, 1971, 128477
Int. Cl. F16h 55/22
U.S. Cl. 74—230.17 E 7 Claims



The invention relates to power transmission mechanisms for vehicles, and is particularly directed to an improved centrifugal clutch designed for use in tracked vehicles, such as snowmobiles. According to the invention a clutch is provided having a drive shaft, a first flange mounted on the shaft for rotation therewith, a second flange displaceable on the shaft, the first and second flanges having opposed tapering surfaces coacting to form a V-belt groove, and spring means are provided for urging the flanges apart. The improvement comprises a flyweight support mounted on the shaft at an end remote from the first flange for rotation therewith. Flyweights are pivotally mounted to the support, for engagement with the first and second spaced apart bearing surface respectively on the second flange, the center of gravity of the flyweights being located such that at a predetermined r.p.m. of the shaft, the flyweights will co-act with the first bearing surface to cause

the axial displacement of the second flange, and the initial engagement of the clutch. Upon subsequent increase of shaft r.p.m., the flyweights co-act with the second bearing surface, causing a second, substantially lesser and controllable increase in axial displacement of the second flange. The purpose of the invention is to enable the vehicle to give initial power delivery to the gear train at the optimum torque or horsepower as may be desired.

3,777,584

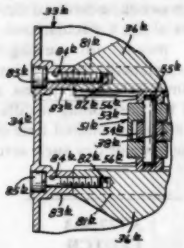
CENTRIFUGAL CLUTCH

Perry M. Domaas, Minneapolis, Minn., assignor to Textron, Inc., Providence, R.I.

Continuation-in-part of Ser. No. 82,633, Oct. 21, 1970, and a continuation-in-part of Ser. No. 233,223, March 9, 1971. This application Sept. 20, 1972, Ser. No. 290,630

Int. Cl. F16h *55/52*

U.S. Cl. 74—230.17 E **7 Claims**



A variable ratio centrifugal clutch having driving and driven assemblies connected by an endless belt. The driving assembly consists of a pair of sheaves affixed to a drive shaft, one being axially stationary and the other being axially movable with respect thereto. The movable sheave forms part of an enclosed housing in which a plurality of flyweights are pivotally mounted. The flyweights operate in conjunction with a stationary member which is also disposed inside the enclosure. Guide members formed on one side of the rotatable enclosure and projecting axially toward the stationary member operate in conjunction with guiding portions on the stationary member to insure proper relative axial movement therebetween. The extreme ends of the projecting guide members are secured to the opposite side of the rotatable enclosure to resist centrifugal forces and prevent wear and fatigue on the guide members due to strain. In response to increased drive shaft speed, the flyweights swing outward and engage the stationary member to move the housing in its entirety along the shaft to bring the sheaves together.

3,777,585

VARIABLE SPEED DRIVE HAVING SPEED LIMITING MEANS

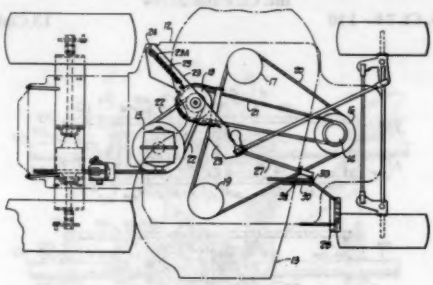
Gunter F. Plamper, Lakewood, Ohio, assignor to MTD Products Inc., Cleveland, Ohio

Division of Ser. No. 116,443, Feb. 18, 1971, Pat. No. 3,583,535. This application Jan. 10, 1973, Ser. No. 322,500

Int. Cl. F16h *55/22*

U.S. Cl. 74—230.17 D **3 Claims**

A variable speed drive for a tractor or the like having a pulley-and-belt driving arrangement between engine and driving wheel providing adjustable variation in the speed and adjustable means for limiting the degree of variation in the speed. This is an abstract only of the specific illustration of the invention given by way of example, and is not to be used in the interpretation of the claims nor as a limitation on the scope of the invention.



3,777,586

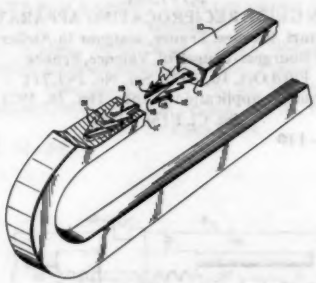
LOCKING BELT

Alfred L. Stirton, P.O. Box 1181, Susanville, Calif.

Filed May 13, 1971, Ser. No. 143,101

Int. Cl. F16g *1/00*

U.S. Cl. 74—231 J **5 Claims**



A belt for automobiles, machinery, belt-driven tools, implements and items that have use for pulley driven belts, and the like.

This belt includes a toothed and pronged male member which will be inserted into a hollow toothed female so as to effectively secure the ends together in order to form a continuous belt. More than one lenght of belt can be inserted into each other to form any desired length needed.

3,777,587

SCREW DRIVING APPARATUS HAVING MAGNET NUT

Naomi Hoshina, Yokohama, and Etsuji Suzuki, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Company Limited, Kawasaki-shi, Japan

Filed Feb. 10, 1972, Ser. No. 225,196

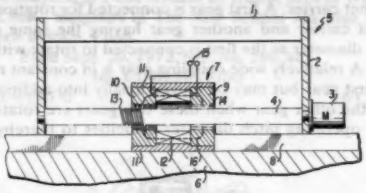
Claims priority, application Japan, Feb. 18, 1971, 46/5376

Int. Cl. H02k *7/06*

U.S. Cl. 74—424.8 R **12 Claims**

A continuously threading drive screw made of a paramagnetic material is magnetically surrounded in a nut being radially spaced to operate a determinate reciprocable non-engag-

ing movement of one with respect to the other by rotation of the drive screw, said nut being threaded the same as the drive



screw and having at least to magnetic pole pieces, and being provided with means for energizing the pole pieces.

3,777,588

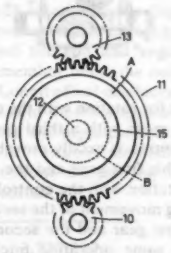
INTERMEDIATE GEAR

Takashi Takahashi, 1-458 Soshigaya, Setagayaku, Tokyo, and Teru Hayashi, 413-4 Minamitsunashimacho, Kohokuku, Yokohama, both of Japan

Filed June 23, 1972, Ser. No. 265,572

Int. Cl. F16h *55/18, 57/04*

U.S. Cl. 74—440 **1 Claim**



This invention relates to an intermediate gear which is divided into two concentric portions, the inner portion of which being provided with a flange gear which is in mesh with either the driving or driven gear.

3,777,589

MECHANICAL DRIVE TRANSMISSION SYSTEMS

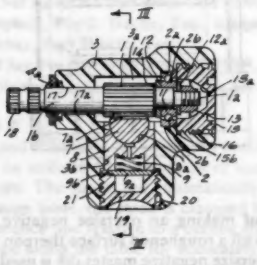
Frederick John Adams, Campton, near Shefford, England, assignor to Cam Gears Limited, Hitchin, Hertfordshire, England

Filed Sept. 1, 1971, Ser. No. 177,048

Claims priority, application Great Britain, Sept. 18, 1970, 44,570/70

Int. Cl. B62d *3/12*

U.S. Cl. 74—498 **12 Claims**



A mechanical drive transmission, especially for rack and pinion vehicle steering gear, having the drive transmitting components supported in a non-metallic molded housing which is rigid enough to maintain good bearing support of the components, resilient enough to provide good shock absorbing characteristics, and strong enough to withstand the same magnitude of shocks and loads as heretofore used metallic housings. The non-metallic housings of this invention are preferably formed by injection molding to accurate dimensions and need not be machined or threaded to properly support the drive transmitting components. Preferred materials for the housing are nylons, acrylonitrile-butadiene-styrenes, polyacetals, and polypropylenes which may be reinforced with glass fibers.

3,777,590

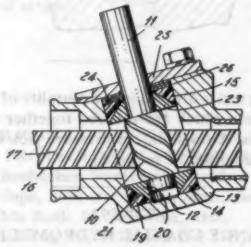
RACK AND PINION STEERING GEAR

Jeffrey George Ernest Parkes, Sawbridgeworth, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed May 15, 1972, Ser. No. 253,223

Int. Cl. B62d *1/20;* **F16c** *25/00*

U.S. Cl. 74—498 **6 Claims**



A bearing assembly for a rack and pinion steering gear having a pair of conical plastic bearing rings that engages a pair of metallic bearing rings. The bearing assembly supports the pinion of the steering gear against both radial and axial loads.

3,777,591

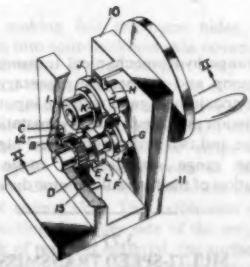
ROTATION LIMITING DEVICE

Harvey A. Thomasian, Northboro, Mass., assignor to Lowell Corporation, Worcester, Mass.

Filed Mar. 15, 1971, Ser. No. 124,272

Int. Cl. G05g *1/00;* **F16h** *55/04, 27/06*

U.S. Cl. 74—576 **4 Claims**



This invention relates to a rotation limiting device and, more particularly, to apparatus for stopping the rotation of a shaft at each end of a predetermined angular rotation.

3,777,592

CONNECTING RODS OF INTERNAL COMBUSTION ENGINES

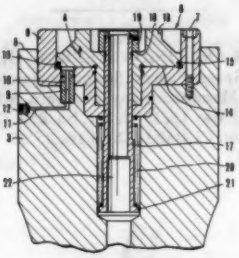
Takashi Ito, Tokyo, Japan, assignor to Mitsui Shipbuilding & Engineering Co. Ltd. and Japan Ship's Machinery Development Association, Tokyo, Japan

Filed Sept. 29, 1972, Ser. No. 293,575

Claims priority, application Japan, Sept. 30, 1971, 46/85972

Int. Cl. F16c *7/00*

U.S. Cl. 74—579 E **4 Claims**



A connecting rod is divided into a plurality of sections along a transverse plane which are secured together by means of a plurality of bolts. A single liquid pressure jack is contained in one section to separate the sections.

3,777,593

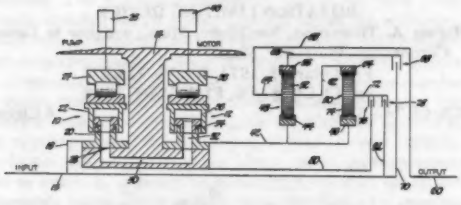
MULTI-RANGE COAXIAL HYDROMECHANICAL TRANSMISSION

James J. Mooney, Jr., and James C. Polak, both of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 22, 1971, Ser. No. 200,919

Int. Cl. F16h *47/04*

U.S. Cl. 74—687 **7 Claims**



A multi-range hydromechanical transmission in which the hydraulic pump and motor, the planetary gear set and the clutches are coaxially aligned with the input and output shafts. The transmission provides a fully hydrostatic low, forward and reverse range and two hydromechanical higher speed forward ranges. The range changes are made with substantial synchronization of the hydraulic motor during the change.

3,777,594

MULTI-SPEED TRANSMISSION

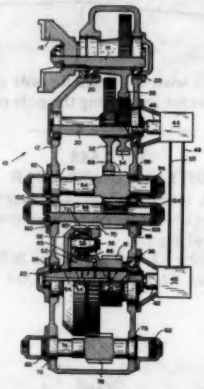
Barry Lewis Frost, Jackson, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Dec. 9, 1971, Ser. No. 206,250

Int. Cl. F16h *47/04*

U.S. Cl. 74—687 **17 Claims**

A multi-speed transmission is disclosed having a planetary gear set wherein the sun gear is connected for rotation with an output shaft, a variable speed control shaft is connected for rotation with the planetary ring gear, and a planet gear which is in mesh with both the ring gear and the sun gear is carried by a planet carrier. A first gear is connected for rotation with the planet carrier and another gear having the same operating pitch diameter as the first is connected to rotate with the ring gear. A relatively wide coupling gear is in constant mesh with the first gear but may be moved axially into additional mesh with the other gear when these two gears are rotating at the same operating pitch diameter velocities to thereby connect



the planet carrier for rotation with the control shaft. A second gear in constant mesh with a third gear that is rotated by a suitable power source is axially movable into mesh with the first gear while this first gear and the planet carrier are still connected for rotation with the control shaft via the coupling gear, this meshing movement of the second gear occurring at a time when the first gear and the second gear are rotating at substantially the same operating pitch line velocities. The second gear may also be moved axially out of mesh with the first gear while these two gears are under load.

3,777,595

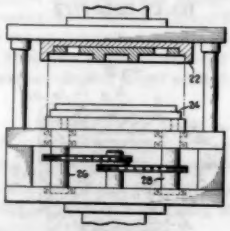
METHOD OF MAKING A MASTER DIE FOR USE IN AN ABRASION PROCESS

Elmer P. Hausermann, 4 N. 224 Hawthorne, Bensenville, and Marten C. Hausermann, 131 S. Grant, Addison, both of Ill.

Filed July 19, 1971, Ser. No. 163,941

Int. Cl. B21k *5/20*

U.S. Cl. 76—107 R **6 Claims**



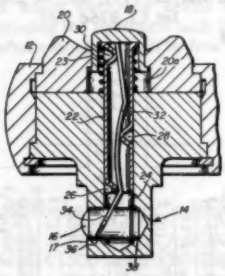
A method of making an oversize negative master die or working tool with a roughened surface thereon from a positive model. The oversize negative master die is used in conjunction with automated apparatus to prepare identical duplicate electrical discharge machining electrodes of the same dimensions as the model.

3,777,596

RESILIENT QUICK RELEASE FOR SOCKET WRENCH

William H. Smyers, Jr., and Ronald D. Russo, both of Wethersfield, Conn., assignors to The New Britain Machine Company, New Britain, Conn.

Filed Sept. 20, 1972, Ser. No. 290,441
Int. Cl. B25b 13/00
U.S. Cl. 81—177 G 10 Claims



A socket wrench has a driving member with a detent member projecting therefrom which may be retracted to quickly release the socket. Longitudinally disposed in the driving member for sliding movement, is an elongated pin having a resilient member carried thereon and engaging the detent member. The resilient member limits the outward movement of the detent member. Longitudinal displacement of the elongated pin forces the resilient member against an inclined surface of the detent member and urges the detent member into a withdrawn position. The resilient member allows manual removal of the socket from the driving member without damage to the detent member.

3,777,597

METHOD OF SHAVING EMPLOYING AN AQUEOUS SOLUTION OF DEXTRAN

John R. Herb, Easton, Pa., assignor to Pharmachem Corporation, Bethlehem, Pa.

Filed Apr. 29, 1970, Ser. No. 33,071
Int. Cl. B26d 7/08; A61k 7/14
U.S. Cl. 83—22 2 Claims

Compositions are provided for assisting in shaving which contain dextran. The dextran substantially reduces the razor friction and also acts as a toner for the skin. In the method of this invention, the dextran containing composition which may be in the form of a clear liquid, gel, cream, lather or foam is applied to the skin to be shaved. The unwanted hair is then shaved off with a razor in a conventional manner.

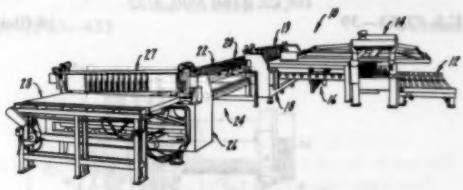
3,777,598

METHOD AND APPARATUS FOR CUTTING PANELS

James W. Campbell, Forth Worth, Tex., assignor to Haltom City State Banks, Fort Worth, Tex.

Division of Ser. No. 805,943, Feb. 17, 1969, Pat. No. 3,662,798. This application Sept. 10, 1970, Ser. No. 71,102
Int. Cl. B26d 7/06
U.S. Cl. 83—29 R 8 Claims

The method and apparatus for efficiently cutting accurately sized panels in an unlimited combination of sizes and shapes from larger sheets. The sheets are automatically counted and stacked on a gauge table, the stack is clamped by jaws which establish in reference line relative to a cutting station, and the stack is advanced along the table for accurately dimensioned rip cuts. One or more of these cut stacks are then moved on a rip run-out unit to a cut-off infeed and gauge table where they are automatically aligned, clamped to establish a second reference line, and accurately advanced to a cut-off station where cross-cut sawing produces finished panels. The stacks are moved and gauged by either digital or analog hydraulic servo motors which accurately position the reference lines relative to the saw stations by controlled deceleration of the load to stop the stacks. At each saw station holddowns prevent sheet displacement as the saw traverses. Each saw automatically senses cutting load and returns to its initial position immediately upon finishing a cut. Linear saw speed is controlled as a function of saw load. Means are provided to automatically remove trim and scrap.



3,777,599

PROCESS FOR PRODUCING SPLIT-THICKNESS ANIMAL SKIN FOR PROTECTING FLAYED HUMAN TISSUE

Frank W. Reichenbacher, Scottsdale; Theodore C. Kraver, and Edward F. Hope, both of Phoenix, Ariz., assignors to Burn Treatment Skin Bank, Inc., Phoenix, Ariz.

Filed Aug. 23, 1971, Ser. No. 173,805
Int. Cl. C14b 1/14
U.S. Cl. 83—39 4 Claims

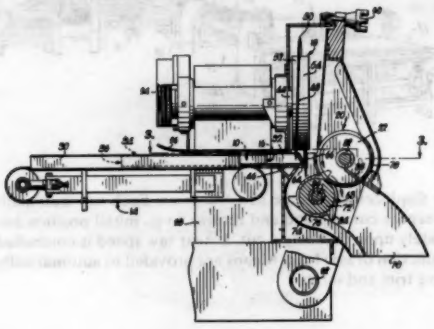
CUT SKIN INTO STRIPS
SHAVE SKIN STRIPS
REMOVE EXCESS FAT FROM SKIN STRIPS
WASH SKIN STRIPS
EXFOLIATE OUTER LAYER OF SKIN STRIPS
TO STERILIZATION AND PACKAGING

A process for making full thickness hides of freshly slaughtered animals into split-thickness skin coverings for use in covering flayed sites of the human body where full thicknesses or partial thicknesses of portions of the skin have been destroyed by burns, trauma or ulcerative conditions. A full thickness animal hide is cut into convenient strips, the hair and excess fat are removed from the strips to provide smoother, more regular surfaces thereon to facilitate the removal of a uniform dimension split-thickness external portion of the strip of animal skin. The exfoliation step is performed while supporting the inner side of the strip of animal skin against a block of resilient material, the surface of which deforms to adjust itself to the somewhat irregular inner surface of the animal skin so as to exert substantially even pressures on the inner surface, thus presenting a functionally level outer surface of animal skin to the cutting tool used to exfoliate a thin uniform-thickness strip of outer skin. This process avoids making large unnatural holes which would lessen the effectiveness of the finished product and is more efficient and more reliable than prior art methods.

3,777,600
MACHINE FOR AND METHOD OF SEVERING MEAT SLABS

Marshall Long, Leawood, Kans.; Lewis F. Alley, Kansas City, and William A. Reynolds, Galena, both of Mo., assignors to Marlen Research Corporation, Overland Park, Kans.

Filed Oct. 13, 1971, Ser. No. 188,907
Int. Cl. B26d *3/00, 4/22*
U.S. Cl. 83—39 **18 Claims**

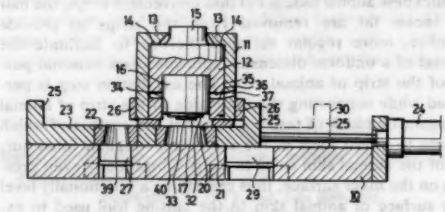


Frozen meat slabs or the like are subjected to the constantly rotating action of a blade provided with a single convolution having a helical cutting edge for severing the slab into elongated strips whose widths are essentially the same as the distance which the slab is advanced during each revolution of the blade, and to the action of a gang of constantly rotating, peripherally sharpened discs which slice the strips into polygonal pieces, e.g., cubical, for further processing, as in stew. Each transverse kerf produced by the blade is initially concave and is progressively increased in depth and in length toward both side edges of the slab while the latter is firmly supported therebeneath by an anvil along which the blade helix causes the slab to slide continuously. The final cutting action for producing each strip is in the form of a shear during which the cutting edge of the blade acts in point contact with a concave, terminal shear edge of the anvil, causing the severed strip to fall away from the slab. The descending strips are intercepted and successively forced forwardly into the bank of discs, without interruption, along an arcuate course, in the same general direction as the path of travel of the slab, by a lobed feeder interleaved with the discs and rotating continuously about an axis parallel with the axis of rotation of the discs but in a direction opposite to the direction of disc rotation.

3,777,601
PUNCHING APPARATUS

Per-Olof Strandell, Bockstigen 3, Taby, Sweden

Filed Mar. 29, 1971, Ser. No. 128,659
Int. Cl. B26d *7/06*
U.S. Cl. 83—160 **4 Claims**

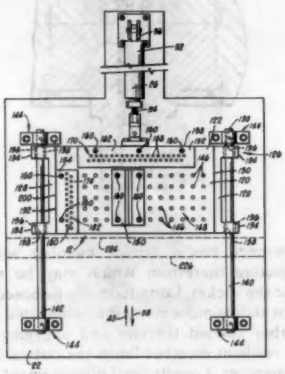


A punching apparatus having a punch holder rigidly supporting two punches which at least partially overlap each other, and dies co-acting with their respective punch, at least one of the dies being movable away from its position in which it cooperates with its respective punch, while said punch objects into a perforation made in a workpiece by the same.

3,777,602
DIE FIXTURE AND CONTROL APPARATUS

Charles J. Youra, Van Nuys, Calif., assignor to Doric Corporation, Oklahoma City, Okla.

Filed Mar. 28, 1972, Ser. No. 238,803
Int. Cl. B26d *5/20*
U.S. Cl. 83—204 **21 Claims**

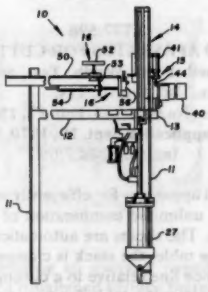


An improved die fixture and control apparatus for positioning a workpiece blank to be formed in a punch press wherein the die fixture is automatically and controllably movable between a stamping station and a loading station at an adjustable, controlled rate of speed and the die fixture delay time at the stamping station and at the loading station are each independently controllable. The die fixture includes a plurality of spaced, identifiable index openings for positioning the lower die element and one or more locators in predetermined, fixed positions, the locators having blank engaging surfaces for engaging a workpiece blank and positioning the workpiece blank in a predetermined position in the die fixture.

3,777,603
HOLLOW VANE SHEAR

John William Franklin Tracy, 1820 Fremont Ave. North, Minneapolis, Minn.

Filed Apr. 5, 1972, Ser. No. 241,343
Int. Cl. B26d *5/28, 5/38, 7/16*
U.S. Cl. 83—212 **7 Claims**



A device for cutting to length, by shearing, material known in the sheet metal and air conditioning trades as "hollow turn-

ing vanes" and which device employs a wedge shaped, sharply pointed blade to enter and pierce the top side of the vane without undue distortion and a bottom blade unit having a pair of spaced blades conforming to the bottom contour of the vane with means for forcing the upper blade into and through the bottom blade unit thereby shearing the vane with guides for the blade and clamp means for holding the vane in position during cutting also being provided. The device includes length adjustment means to control the length of the vane being cut and an automatic switching device to initiate the action of the various elements which switching device is automatically shiftable after initiating the operation such that the cut vane will not be held after cutting and will be free to drop from the device.

3,777,604

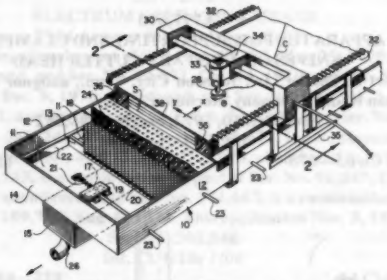
APPARATUS FOR SUPPORTING A STACK OF SHEET MATERIAL BEING CUT OR OTHERWISE WORKED ON

Heinz Joseph Gerber, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., East Hartford, Conn.

Continuation of Ser. No. 91,965, Nov. 23, 1970, abandoned. This application Apr. 25, 1972, Ser. No. 247,468

Int. Cl. B26d *1/10;* **A41h** *43/00*

U.S. Cl. 83—374 **28 Claims**



Apparatus for supporting a stack or layup of air-impervious sheet material to be cut or otherwise worked upon includes a horizontal base on which the stack is positioned. The stack is covered by an air-impervious cover sheet, and by as associated vacuum means, air is withdrawn from between the top of the stack and the cover sheet to create a sub-atmospheric pressure under the cover sheet whereby atmospheric pressure on the top of the cover sheet will hold the stack in a firm condition while it is worked upon by a cutting tool or the like. The means for withdrawing air from between the cover sheet and the top of the stack includes a porous or air conducting layer of material, such as corrugated cardboard, which may be part of the cover sheet or a separate sheet in itself. If the material of this stack includes layers of porous material alternating with layers of air-impervious material, the latter porous layers themselves serve as air-conducting layers for withdrawing air from below the cover sheet and from between the layers of air-impervious material of the stack. Preferably, to provide the vacuum means, the horizontal base for supporting the stack is air-pervious and located over a vacuum chamber with the vacuum from the chamber passing through the horizontal base and past the longitudinal edges of the stack, through a block or layer of air conducting material, to the space between the cover sheet and the top of the stack.

3,777,605

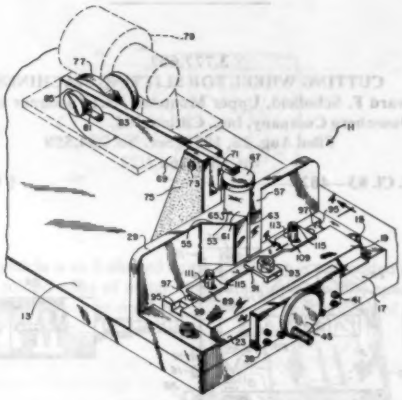
VEE-NOTCHING DEVICE

Raymond A. Spier, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sept. 23, 1971, Ser. No. 182,977

Int. Cl. B26d *7/02*

U.S. Cl. 83—452 **6 Claims**



A device for forming Vee-notches in tensile test specimens comprising a vertically reciprocating, triangular, triple-edged cutting tool guided in a corresponding triangular slot. The specimen to be vee-notched is mounted on a carriage that is movable toward and away from the cutting tool. The specimen is precisely positioned on the carriage by tapered studs that extend into holes in the specimen and are used to expand spring collets against the wall of the holes.

3,777,606

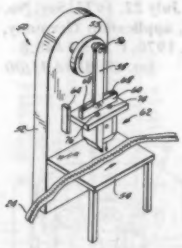
ZIPPER CUTTING APPARATUS

Barry Goldstein, 17 Allen Rd., Rockville Centre, N.Y.

Filed Jan. 13, 1972, Ser. No. 217,533

Int. Cl. B26d *7/02*

U.S. Cl. 83—460 **13 Claims**



A cutting assembly is disclosed for use in a device adapted to remove a predetermined length of zipper teeth from a zipper chain, wherein all portions of the teeth in the length of chain are removed. The device includes a press having a base across which completed zipper chain passes in a predetermined path of travel and a cutting assembly support head which is positioned above the base and mounted for reciprocation in a vertical direction with respect to the base above the path of travel of the zipper chain. The cutting assembly is mounted on the support head for reciprocal movement therewith and includes a plurality of cutting blades having in-

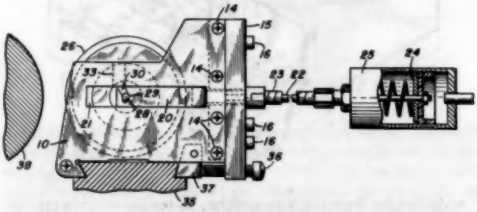
dependent cutting edges. These blades are operatively interconnected with their cutting edges cooperating to define a generally rectangular cutting member having a width larger than the width of the zipper teeth in the zipper chain so that as the support head is reciprocated towards the base, the cutting edges of the cutting assembly engage the zipper chain and cut through the chain and the zipper teeth thereon to sever and remove a rectangular section from the zipper chain.

3,777,607

CUTTING WHEEL FOR SLITTING MACHINES

Edward F. Schofield, Upper Montclair, N.J., assignor to John Dusenberg Company, Inc., Clifton, N.J.

Filed Aug. 28, 1972, Ser. No. 284,559
Int. Cl. B26d *1/22*
U.S. Cl. 83—482 **5 Claims**



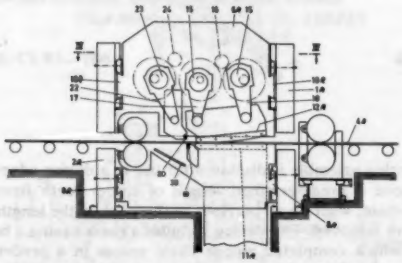
A cutting knife for slitting machines, which knife has a housing adapted for attachment to the machine and a rotary cutting wheel movable toward a backing roll in response to fluid pressure.

3,777,608

SHEAR FOR METAL PLATE

Gerhard Kopf, Dillingen, and Adolf Muller, Hilchenbach-Dahlbruch, both of Germany, assignors to Siemag Siegener Maschinenbau GmbH, Hilchenbach-Dahlbruch, BRD, Germany

Filed July 22, 1971, Ser. No. 165,027
Claims priority, application Germany, July 25, 1970, P 20 36 963.5; Dec. 30, 1970, P 20 64 448.8
Int. Cl. B23d *31/00*
U.S. Cl. 83—517 **10 Claims**



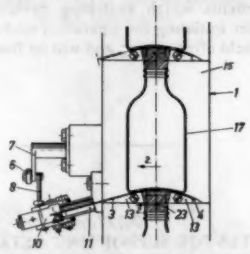
A shear for cutting metal plate in which the knives are mounted on C-shaped yokes which are adjustably mounted between spaced, parallel stands.

3,777,609

DEVICE FOR TRIMMING THE BOTTOM OF HOLLOW PLASTIC BODIES PRODUCED BY BLOW MOLDING

Edmond Michel, Brussels, and Maurice Minsart, Namur, both of Belgium, assignors to Solway & Cie, Brussels, Belgium

Filed Mar. 2, 1972, Ser. No. 231,113
Claims priority, application Belgium, Mar. 3, 1971, 100414
Int. Cl. B26d *5/16, 1/06*
U.S. Cl. 83—635 **9 Claims**



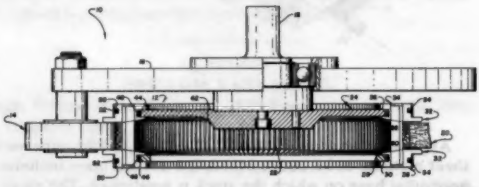
In a blow molding machine, a trimming device for trimming the bottom of hollow plastic bodies after they have been fabricated by extrusion blow molding, including a movable flexible blade, a mechanism for effecting a periodic displacement of the blade and a slide guide which guides the blade during its displacements.

3,777,610

APPARATUS FOR SUPPORTING AND CLAMPING KNIVES ON A ROTARY CUTTER HEAD

Albert E. Spaller, Jr., Johnson City, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 10, 1972, Ser. No. 296,382
Int. Cl. D01g *1/04*
U.S. Cl. 83—678 **12 Claims**



A plurality of knives are supported on and clamped to a rotary cutter head by a plurality of similarly formed wedges aligned in contiguous face-to-face relationship to define two endless, spaced apart arrays for clamping opposite end portions of the knives. Each wedge defines within one of its faces a recess for receiving an end portion of a knife, and further defines on its opposite face a keyed surface that interengages within the recess of an adjacent wedge to abut against the received end portion of an adjacent knife. A band member encircles each array for clamping together the wedges of each array. The clamped knives are thereby made more rigid and more resistant to buckling and twisting due to compressive stresses exerted against the cutting edges by yarn or tow being wrapped around the cutter head in contact with the knives prior to cutting; and in one embodiment are the sole support between the upper and lower array of wedges on the cutter head, and in another embodiment may be tensioned to resist buckling due to still greater compressive stresses or significantly large yarns or tows.

3,777,611

APPARATUS FOR THE MICROMETRIC TUNING OF THE KEYBOARDS AND SIMILAR INSTRUMENTS WITH ELIMINATION OF THE WOODEN SUPPORT OF THE PEGS AND THE PEGS SAME

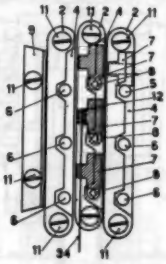
Oronzo Madonna, Via del Mare No. 16, Lecce, Italy

Filed Nov. 26, 1971, Ser. No. 202,519

Claims priority, application Italy, Dec. 11, 1970, 17109 A/70

Int. Cl. G10c *3/10*

U.S. Cl. 84—204 4 Claims



A tuning device formed in its entirety of metal for micrometric tuning of pianos or similar instruments which permits elimination of the wooden peg supports and the pegs in pianos and improves the stability of the tuning.

3,777,612

PLECTRUM OPERATING MEANS

Ellis Barron, 7924 Armour St., San Diego, Calif.

Continuation-in-part of Ser. Nos. 40,273, May 25, 1970, abandoned, and Ser. No. 80,671, Oct. 14, 1970, and Ser. No. 96,547, Dec. 9, 1970, abandoned, and Ser. No. 169,753, Aug. 6, 1971, and Ser. No. 225,713, Feb. 14, 1972, and Ser. No. 274,663, July 24, 1972, said Ser. No. 80,671, is a continuation-in-part of Ser. No. 40,273, May 25, 1970, abandoned, said Ser. No. 169,753, is a continuation-in-part of Ser. No. 96,547, Dec. 9, 1970, abandoned, said Ser. No. 274,663, is a continuation of Ser. No. 169,753, Aug. 6, 1971. This application Nov. 3, 1972, Ser. No. 303,540

Int. Cl. G10c *1/06*

U.S. Cl. 84—258 14 Claims

A plectrum operating means intended primarily for a harpsichord type of musical instrument in which the plectrum is caused to pluck a musical string with a force proportional to the force applied to its corresponding key, and on its return movement clear its string, the plucking movement being partly influenced by arranging the plectrum supporting assembly so as to have an eccentric mass, the inertia of which tends to move the plectrum into engagement with its string, the return movement being partially affected by gravity thereby minimizing inertial effect, and a spring force urging the plectrum clear of the string.

Several embodiments are disclosed which permit different arrangements of the strings and permit tone sustention.

3,777,613

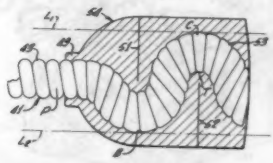
GUITAR STRINGS WITH ENLARGED END

William H. Chaffee; Alfred M. Rubio, and Richard L. Lorenz, all of Chicago, Ill., assignors to Columbia Broadcasting System, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 160,734, July 8, 1971, abandoned. This application July 24, 1972, Ser. No. 274,810

Int. Cl. G10d *3/00*

U.S. Cl. 84—297 S 28 Claims



The article is an S-shaped string end which is embedded in a tightly-folded mass of metal, the metal having axially spaced lateral fold planes on opposite sides of the bent regions of the string.

3,777,614

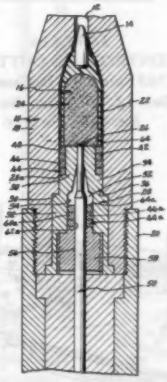
OBTURATOR FOR FIREARM ADAPTED TO FIRE CASELESS OR EXPENDABLE AMMUNITION

John J. Scanlon, Monroe, Conn., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Continuation of Ser. No. 789,233, Jan. 6, 1969, abandoned. This application June 3, 1971, Ser. No. 149,865

Int. Cl. F41c *11/00*

U.S. Cl. 89—26 8 Claims



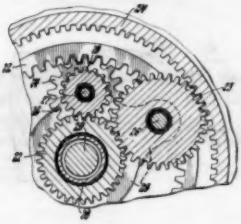
An obturator for a firearm of the type designed to fire caseless or expendable case ammunition. The obturator can consist of at least two slit metal rings mounted on the bolt head of the firearm and arranged so that the pressure of the expanding propellant gases, generated during firing, compresses the rings so that about zero clearance is maintained around both the inner and outer periphery of the rings. The same type of ring may be used to seal around the firing pin.

3,777,615

METHOD OF MAKING COMPOUND PINION GEAR

Oliver K. Kelley, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 82,599, Oct. 21, 1970, Pat. No. 3,721,135.
This application July 28, 1972, Ser. No. 276,065
Int. Cl. B23f 1/04
U.S. Cl. 90—10 2 Claims



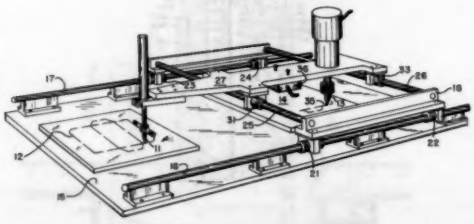
A compound planetary gearset in which the input ring gear drives the large pinion of a compound planetary pinion and the low brake holds the large sun gear meshing with the small pinion, the second brake holds the small sun gear meshing with the large pinion and the direct drive clutch locks the small sun gear to the output shaft and the reverse brake holds a second ring gear which meshes with a reverse pinion, also meshing with the large sun gear. The small pinion and the large pinion of the compound pinion have the same number of teeth. The small pinion has a small pitch and the gears meshing with it the same small pitch, and the large pinion has a large pitch and the gears meshing with it have the same large pitch. The compound pinions are finish cut by a one piece cutter which simultaneously cuts a pair of teeth, one tooth on the large pinion and one tooth on the small pinion, so the teeth on both pinions of each compound pinion have an identical radial alignment relation to each other and all the compound pinions of the gearset are identical in this relation for equal load sharing.

3,777,616

CONTROLLED CUTTING

Joseph F. Mueller, 763 South St., Dedham, Mass.

Filed Dec. 22, 1971, Ser. No. 210,930
Int. Cl. B23c 1/16
U.S. Cl. 90—13.2 4 Claims



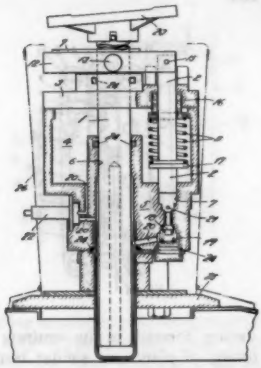
A platform is mounted for movement in *x* and *y* directions and carries a stylus, vibrator and a cutting tool. An operator moves the stylus along a master pattern causing the cutter to cut the master pattern in a sheet of suitable material, such as, 1/16 inch magnesium, plastic or alluminumate.

3,777,617

AUTOMATIC BRAKING DEVICE FOR HYDRAULIC PRESSURE CHAIR

Masaharu Okiyama, 3131-1 Oaza Anamushi Kashiba-cho, Kitakatsuragi-gun, Nara, Japan

Filed Nov. 16, 1971, Ser. No. 199,276
Claims priority, application Japan, Dec. 14, 1970, 45/112209
Int. Cl. F15b 15/26
U.S. Cl. 91—44 5 Claims



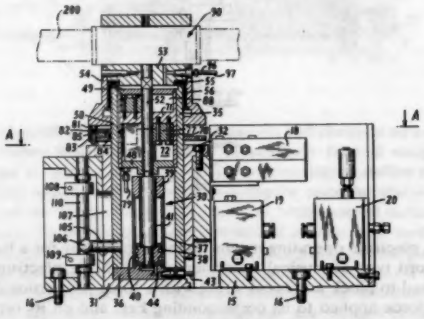
This invention provides an automatic braking device for vertically adjustable hydraulic chairs. The invention is incorporated within the hydraulics and instantly stops and locks the chair seat at any height, without the requirement of external locking means.

3,777,618

ACTUATOR ASSEMBLY FOR USE WITH INDUSTRIAL ROBOTS

Shigeru Iwai, Chiba-shi, and Yoshiaki Kitamura, Higashi-Katsushika-gun, both of Japan, assignors to Kabushiki Kaisha Daini Seikosha

Filed Dec. 27, 1971, Ser. No. 212,344
Claims priority, application Japan, Dec. 26, 1970, 45/118893
Int. Cl. F01b 21/00; F15b 11/16, 15/24
U.S. Cl. 91—61 7 Claims



An actuator assembly for actuating an arm of an industrial robot comprises a reciprocatory motor for effecting vertical reciprocal movement of the robot arm, an oscillatory motor for effecting angular oscillatory movement of the robot arm, and another reciprocatory motor for effecting horizontal reciprocal movement of the robot arm. The reciprocal motors and the oscillatory motor are fluid-actuated and a fluid circuit

is provided for effecting actuation of each of the fluid motors independently of the operation of the others to effect three-dimensional movement of the robot arm with a high degree of precision and accuracy.

3,777,619

HYDRAULIC PIT PROP

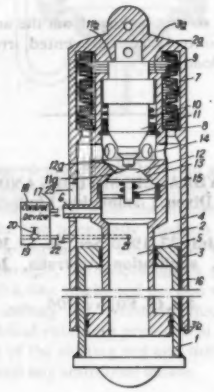
Hans Bull, Wuppertal-Elberfeld, Germany, assignor to Hermann Hemscheidt Maschinenfabrik, Wuppertal-Elberfeld, Germany

Filed Sept. 26, 1972, Ser. No. 292,339

Claims priority, application Germany, Oct. 4, 1971, P 21 49 451.9

Int. Cl. F01b *15/00*

U.S. Cl. 91—216 R **6 Claims**



An hydraulic prop having a relatively movable piston and cylinder which are surrounded by an outer guide tube provided with a closed end which is normally spaced away from an opposing end of the piston by spring means but which moves telescopically in relation to the piston if excess loads are applied to the prop, such relative movement between the piston and the outer guide tube causing the latter to actuate and move a plunger which, in turn, acts on a valve member in the piston so that liquid under pressure in a pressure chamber of the piston can flow out rapidly past the valve member and thus quickly relieve the prop of transitory excess loads such as those caused by rock falls or a partial collapse of the seam being worked.

3,777,620

IN-HEADER HYDRAULIC OPERATOR

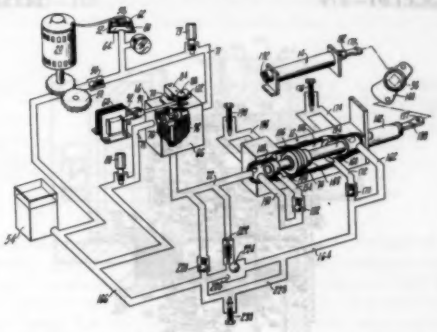
Paul C. Schultheiss, Bristol, Conn., assignor to The Stanley Works, New Britain, Conn.

Division of Ser. No. 94,475, Dec. 2, 1970. This application July 31, 1972, Ser. No. 276,705

Int. Cl. F15b *15/22*; **F01b** *31/00*

U.S. Cl. 91—394 **5 Claims**

Disclosed is an integrated self-contained hydraulic door operator suited for easy in-header mounting in new construction or on a retrofit basis with the availability of a standard A.C. outlet the only architectural requirement. In-line modular subassemblies of the operator are removably mounted on a base plate with leakproof hydraulic connections made automatically during assembly. A double acting spring assembly holds the door in its closed position without backlash, returns the door to its closed position after swinging movement in either direction, and includes an accessible adjustable spring plunger stop for fixing the door open position. A solenoid operated control valve has laterally adjustable valve seats for automatic alignment with the valve and a spring-biased self-lubricating nonlocking cam to serve as a safety relief valve and to control flow from the hydraulic accumulator. The hydraulic power unit includes a special arrangement for supporting the



piston rod against lateral forces throughout its stroke and an overcenter crank which cooperates with the power cylinder for providing hydraulic control during manual emergency operation in the reverse door opening direction.

3,777,621

DOUBLE-ACTING SERVOMOTOR

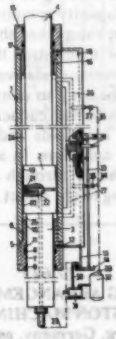
Petrus Blok, Coymanstraat 7, Moerkapelle, and Taco Jan Viersma, Julianalaan 26, Pijnacker, both of Netherlands

Filed Feb. 4, 1971, Ser. No. 112,679

Claims priority, application Netherlands, Feb. 5, 1970, 7001609

Int. Cl. F16b *11/08, 13/04*; **F01b** *31/00*

U.S. Cl. 91—431 **11 Claims**



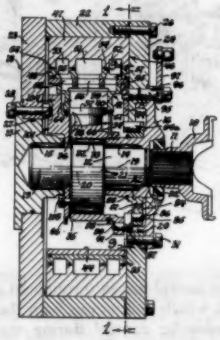
Double-acting servomotor comprising a cylinder and a piston system with piston rods, wherein the clearance extending along the surfaces of the piston system and said cylinder movable relatively to each other and connecting two working chambers is divided into two divisional clearances lying in line and being separated by a circular groove, said divisional clearances being at its one end wider than at its other end and the circular groove being connected with a space in which in operation the pressure has such a value that the pressure at the smaller ends of the divisional clearances is always lower than the pressure at the wider ends of said divisional clearances.

3,777,622

PUMPS AND MOTORS

Gilbert K. Hause, Bloomfield Hills, and William L. Kohler, Detroit, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 24, 1972, Ser. No. 237,782
Int. Cl. F01b 13/06
U.S. Cl. 91—479 14 Claims



A fluid pressure orbiting piston oscillating cylinder machine for use as a fluid pump or motor having a drive or driven power shaft rotatably mounted in a housing and having an eccentric and crank mechanism supporting a spider for orbiting movement. The spider has a plurality of radial arms each having fixed on the radial outer end a spherical piston fitting in a cylindrical cylinder. Each piston is coaxially aligned with the radius of its spider arm. The cylinder has a transverse cylindrical base in bearing engagement with a fixed internal cylindrical bearing surface coaxial with the shaft. A manifold in the housing is connected by ports in the internal cylindrical bearing which cooperate with ports in the cylinder base so that during rotation of the power shaft the pistons orbit in a circular path and the cylinders rotatably oscillate relative to the fixed internal cylindrical bearing to control porting for pump and motor operation. Capacity is controlled by a control ring adjustably rotated about the power shaft axis and connected by cranks to the spider to control the angular position of cylinder oscillating movement relative to the position of the ports in the cylindrical bearing to control the porting to vary capacity between zero and full capacity. In a fluid pump or motor, inlet and outlet manifolds and ports provide feed to and discharge from the cylinders. In a compressor there is a feed manifold and discharge through a check valve through the interior of the housing to the outlet.

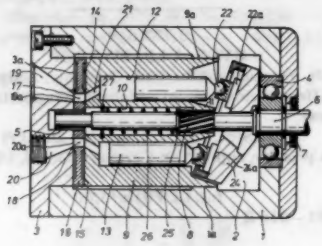
3,777,623

LEAKAGE REDUCING ARRANGEMENT FOR AN AXIAL PISTON MACHINE

Paul Bosch, Ludwigsburg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 7, 1972, Ser. No. 232,478
Claims priority, application Germany, Mar. 17, 1971, P 21 12 814.3
Int. Cl. F01b 13/04
U.S. Cl. 91—487 10 Claims

An arrangement for reducing in a hydraulic axial piston machine, leakage from the area between the rotary cylinder block end face, and the control face of a valve plate having inlet and outlet ports. The cylinder block is mounted on the drive shaft for small axial movement, but is connected for rotation with the drive shaft by a pair of meshing gears having slanted teeth so that the end face of the cylinder block is pressed against the control face with an axial force which depends on the torque transmitted between the drive shaft and



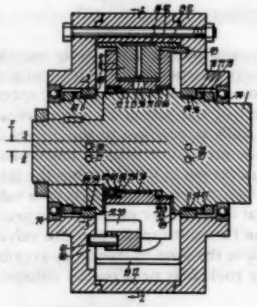
the cylinder block so that leakage from the area between the end face and the control face is prevented, irrespective of the fluid pressure and load.

3,777,624

RADIAL HYDRAULIC MOTORS AND PUMPS

Kenneth Raymond Dixon, 1 Ambleside, Lindisfarne, Tasmania, Australia

Filed July 27, 1970, Ser. No. 58,302
Claims priority, application Australia, July 28, 1969, 58,627/69
Int. Cl. F01b 13/06
U.S. Cl. 91—488 6 Claims



The invention provides an improvement of a radial hydraulic motor or pump of the type having a cylinder block rotatable about a first axis, pistons in the cylinders which have radially inward working faces, and a rotor rotatable about a second axis spaced from and parallel to the first axis; the radially outward ends of the pistons slidably bearing on chordal flats on the rotor. The improvement comprises replacing the pistons by reciprocating members which may be in or on the cylinders and which have a port passing through them so that radial outward forces occasioned by hydraulic fluid in the cylinders are borne hydraulically substantially entirely and substantially directly by the flats on the rotor rather than by the working faces of the pistons and, in turn, mechanically by the flats on the rotor.

ERRATUM

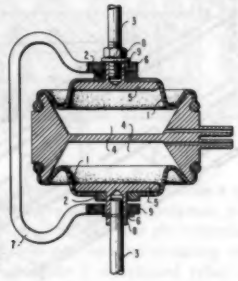
For Class 91—411 see:
Patent No. 3,777,629

3,777,625

PNEUMATIC SERVOMOTOR

Rudolf Andres, Sindelfingen, Germany, assignor to Daimler Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed May 14, 1971, Ser. No. 143,414
Claims priority, application Germany, May 15, 1970, P 20 23 858.8
Int. Cl. F01b 19/00
U.S. Cl. 92—48 1 Claim



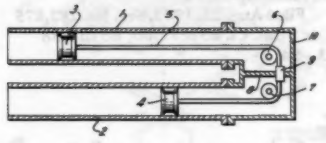
A pneumatic servo-motor, especially an adjusting motor for flaps or other reciprocable structural parts in motor vehicles, which is equipped with at least one diaphragm closing off a working space for the pneumatic medium and mechanically connected with a shifting rod abutting in the working space against the diaphragm; the diaphragm is provided centrally thereof with a disk-like thickened portion which abuts either directly at the shifting rod extending through the same or abuts at a cylindrical extension provided at the abutment disk for the fastening of the shifting rod and thereby assures an effective seal without any additional means.

3,777,626

PUMP CONSTRUCTION

Rudi Schurenberg, Essen, and Heinz-Eckard Wenzel, Wanne-Eickel, both of Germany, assignors to Torkret GmbH, Essen, Germany

Filed July 15, 1971, Ser. No. 162,966
Claims priority, application Germany, Feb. 12, 1971, P 21 06 713.0
Int. Cl. F01b 9/00
U.S. Cl. 92—137 7 Claims



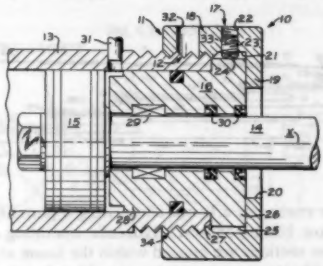
A pump for viscous materials has a pair of cylinders each of which is provided with a working end which receives viscous material, and with a remote end. Pistons are reciprocable in each of the cylinders and a casing bridges the remote ends and is provided with one or two interior chambers. One or two rollers are turnably mounted in these chambers and ropes or the like are trained about the single or several rollers and connected at one end with one of the pistons and, if there is a single rope, connected at the other end with the other piston or, if there are two ropes, connected at the other end with a control piston which is slidable in a separate channel of the respective cylinder, or with a single control piston which is slidable in a separate channel of one of the cylinders.

3,777,627

END CAP LOCKING MEANS FOR HYDRAULIC CYLINDERS AND METHOD

James C. Goade, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 7, 1972, Ser. No. 242,101
Int. Cl. F16j 15/18, 11/04
U.S. Cl. 92—168 8 Claims



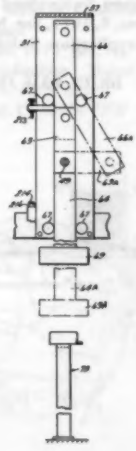
A hydraulic cylinder comprises a housing having an end cap threadably mounted on an end thereof. A cylindrical gland is closely fitted within the housing and end cap to transmit a locking force from a set screw, threadably mounted on the end cap, to diametrically opposed portions of the interengaging threads attaching the housing and end cap together.

3,777,628

QUAD STAYING MACHINE

Robert H. Nickum, c/o Norwood Tool & Die Co., 5123 Montgomery Rd., Cincinnati, Ohio

Filed Feb. 14, 1972, Ser. No. 226,156
Int. Cl. B31b 1/46
U.S. Cl. 93—41.1 9 Claims



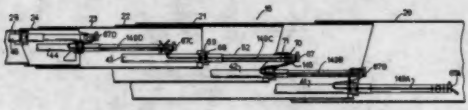
A machine for forming stays on four edges of a carton. The machine includes a mandrel which drives a carton blank provided with stays between upright stay forming members and upright side panel forming members to fold side panels against the mandrel and to partially form stay members. Further advance of the mandrel causes the front and rear panels to engage forming members to be folded to a position substantially perpendicular to the central panel with outwardly extending portions of the stay members opposite edge portions of the end panels. Stay forming and crimping members are advanced into engagement with the outwardly extending portions of the stay members to drive prongs thereof into edge portions of the end panels and to crimp the prongs therein.

3,777,629

HYDRAULIC CYLINDER FOR TELESCOPIC BOOM

Roger L. Johnston, and Daniel Charles Wiencek, both of Cedar Rapids, Iowa, assignors to Harnischfeger Corporation, Milwaukee, Wis.

Filed Sept. 18, 1972, Ser. No. 289,987
Int. Cl. F15b *11/20*; E02f *3/00*
U.S. Cl. 91—411 R 9 Claims



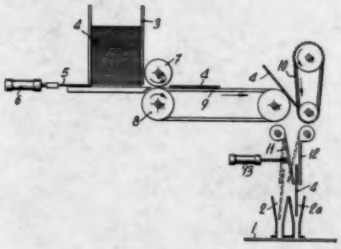
A mobile crane has a boom comprising a plurality of telescopic hollow boom sections. Hydraulic operating cylinders for the boom sections are housed within the boom and each is provided with its own remotely operable electrically controlled main valve. Each cylinder comprises a housing and a rod therein which cooperate to define an extend chamber and a separate retract chamber. Passages in the rod connect these chambers to ports on the main control valve which is mounted on the rod. Hydraulic fluid is supplied to the valves by flexible hydraulic fluid hoses disposed between the side plates of adjacent boom sections and the hoses uncoil or coil in a frictionless manner as the sections are extended or retracted.

3,777,630

PANEL INSERTING APPARATUS FOR BEEHIVE PARTITION ASSEMBLY

Emilio Roda, Noranco, Switzerland, assignor to Fratelli Roda S.A., Noranco-Lugano, Switzerland

Filed Dec. 9, 1971, Ser. No. 206,314
Claims priority, application Switzerland, July 14, 1971, 10398/71
Int. Cl. B31b *1/02*
U.S. Cl. 93—37 R 1 Claim



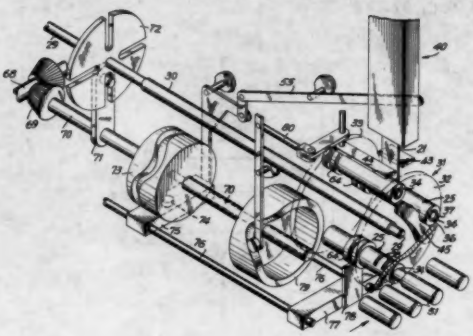
An automatic apparatus which may be adapted to a machine for manufacturing "beehive" baffle bodies for inserting the longitudinal elements of said bodies, having a magazine containing said elements, means to push one of said elements towards an inserting device which conveys said element into deflecting guide means which is actuated intermittently with said pusher by means of actuated members, a plurality of vertical parallel channels below said deflecting guide means to receive said elements and to allow said elements to drop onto said conveying means, said actuating members for the deflecting guide means adapted to provide for the introduction of one of said elements at a time, successively, into each channel.

3,777,631

APPARATUS FOR FORMING A CYLINDER

Donald R. Trask, Bat Village, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed July 21, 1971, Ser. No. 164,557
Int. Cl. B31c *3/02*
U.S. Cl. 93—81 R 11 Claims



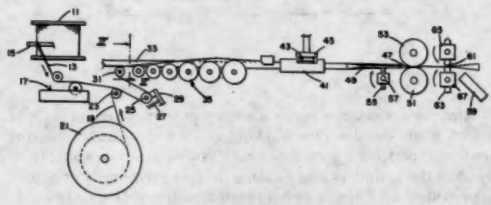
An apparatus for forming a cylinder is disclosed. It is useful, for example, for forming cylindrical battery can separator liners from a continuous strip of paper liner stock. The apparatus includes a forming tube having a receiving chamber that is defined by the inner surface of an outer tubular member and the outer surface of a central cylindrical member. The apparatus also includes means for sequentially positioning said forming tube at receiving and eject stations, and means for feeding the leading edge of a predetermined length of liner into said receiving chamber through a longitudinal slot in said outer tubular member. The outer tubular member has at least one transverse opening that is constructed to permit the extension therethrough of a friction element to engage the liner in the receiving chamber as said forming tube is moved from said receiving station toward the eject station to thereby wind the liner up into cylindrical configuration by catching the liner between the friction element and the central cylindrical member. After the liner has been wound up into a cylinder, ejection means ejects the liner from the forming tube, for instance, into a battery can.

3,777,632

SLEEVE MAKING APPARATUS AND METHOD

Carl R. Pepmeier, Fredericksburg, Va., assignor to FMC Corporation, Philadelphia, Pa.

Filed Aug. 22, 1972, Ser. No. 282,675
Int. Cl. B31c *13/00*; R31b *1/38*
U.S. Cl. 93—94 12 Claims



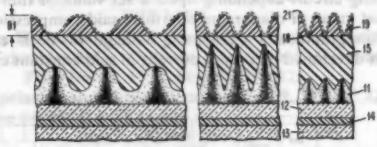
Apparatus and method in which a continuous web, having a continuous tear strip extending longitudinally thereof, is formed into a continuous tube, slit simultaneously along opposite sides of the tear strip at intervals spaced longitudinally of the continuous tube, and then severed transversely at locations extending across and inbetween the ends of the slits therein to provide individual sleeves each having a longitudinally extending tear strip for use in effecting sleeve rupture.

3,777,633

STRUCTURE FOR MAKING PHASE FILTERS

Joseph Pennell Kirk, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 25, 1972, Ser. No. 229,496
Int. Cl. G03c 5/00, 11/00
U.S. Cl. 95—1 R 8 Claims



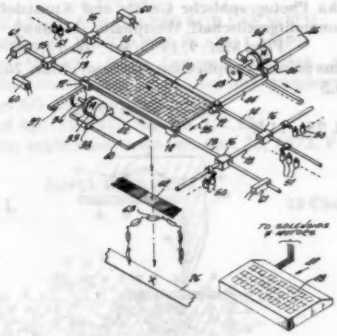
A high fidelity phase filter is made from a composite structure composed of a negative photopolymer, preferably a photoresist, layer which is affixed to a photoemulsion substrate in an optically flat and non-opaque coupling relationship. The photopolymer layer has a developed relief image which is derived by exposure of the photopolymer layer through a previously recorded and developed optical density image in the photoemulsion. The density image, and consequently the resultant relief image derived therefrom, is related to the phase modulation desired for the filter. The structure may be used as a master from which filters of the transmissive and/or reflective types are made by conventional mechanical reproduction techniques. Alternatively, it may be used as an integral part of the filter per se by affixing a reflective coating to the surface of the photopolymer layer, in which case the filter is of the reflective type.

3,777,634

PHOTOGRAPHIC COMPOSING DEVICE

Murray Friedel, North Miami, Fla., assignor to Visual Graphics Corporation, New York, N.Y.

Filed Sept. 18, 1972, Ser. No. 290,126
Int. Cl. B41b 17/06
U.S. Cl. 95—4.5 4 Claims



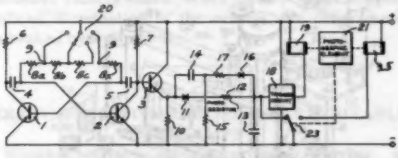
A photographic device for aligning, spacing and printing a series of symbols upon a photosensitive member. The symbols are arranged on a grid-type transparency frame which is mounted on a rectangular coordinate system of sliding guides so that any one of a large number of symbols can be selected and moved to a printing position. An optical system focuses the light from the symbol onto a photosensitive member and the member is then developed and fixed to produce the desired indicia.

3,777,635

DEVICE FOR FEEDING EXPOSURE VALUES TO APPARATUS INCLUDING PHOTOELECTRIC EXPOSURE METERS AND CONTROL DEVICES

Fritz Belitz, Giessen-Kl. Linden, and Karl-Richard Bender, Weilburg (Lahn), both of Germany, assignors to Minox GmbH, Giessen, Germany

Filed Jan. 31, 1972, Ser. No. 222,240
Claims priority, application Germany, Feb. 6, 1971, P 21 05 573.2
Int. Cl. G03b 7/08
U.S. Cl. 95—10 CT 10 Claims



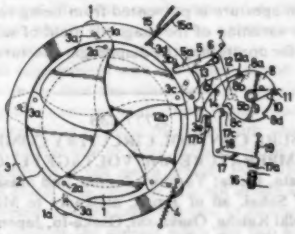
In a photographic system, a pulse generator generates a multicycle pulsating D.C. voltage whose medium or average value can be varied. The voltage is fed, via a photoconductive means, to an integrating capacitor which is connected to a threshold circuit. The threshold circuit operates when the voltage across the capacitor reaches a predetermined value to control a photographic element such as a shutter. The value of the pulsating D.C. voltage is controllably varied in accordance with desired exposure values such as film speed or lens opening to be set into the system.

3,777,636

ELECTRONIC SHUTTER IN CAMERA

Toshinori Imura, Sakai, and Yoshifusa Fujii, Mori, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Minamiku, Osaka, Japan

Filed June 24, 1971, Ser. No. 156,251
Claims priority, application Japan, June 30, 1970, 45/57651; June 30, 1970, 45/57652
Int. Cl. G03b 7/08
U.S. Cl. 95—10 CT 6 Claims

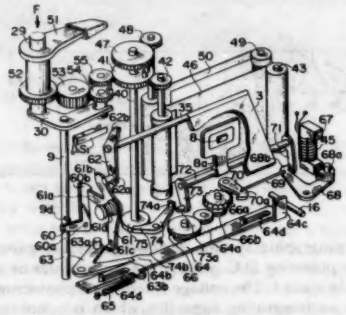


The device includes an electromagnet and an arresting member for a sector driving member and a closing effecting member. The electromagnet is energized by closing the switch of an exposure time control circuit to release the shutter and deenergized under the control of the exposure time control circuit. When attracted upon energization of the electromagnet, the arresting member permits the sector driving member to move in the shutter opening direction, and when the electromagnet is deenergized, the arresting member returns under the action of a restoring spring and initiates the closing effecting member into movement in the shutter closing direction. Thus the initiation of opening and closing of the shutter is controlled by the above-mentioned only one electromagnet.

3,777,637
AUTOMATIC EXPOSURE CONTROL DEVICE FOR A PHOTOGRAPHIC CAMERA

Yoshio Kuramoto; Kayoshi Tjujimoto, both of Osaka, and Hiroshi Ueda, Nara, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaki-shi, Osaku-fu, Japan

Filed May 18, 1972, Ser. No. 254,506
Claims priority, application Japan, May 31, 1971, 46/37049
Int. Cl. G03b *7/08, 9/06*
U.S. Cl. 95—10 CD **9 Claims**



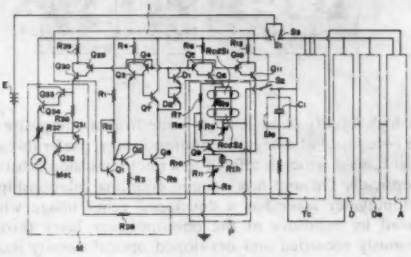
An automatic exposure control device for a photographic camera provided with an exposure control circuit including a light receiving element receiving the scene light passing through an objective lens and a diaphragm, and operating in accordance with photographic conditions such as the generated current of said light receiving element, the set shutter speed and the set film sensitivity in the camera, an electromagnetic coil whose magnetic field varies according to the output of said exposure controlling circuit, and a retaining member retaining the diaphragm in a fully open state so biased that the aperture will be reduced from its fully open condition. While closing the switch of the exposure controlling circuit prior to the shutter is initiated for actuating the exposure controlling circuit, releasing the retaining member thereby causes the diaphragm to start reducing the aperture size and when the brightness of the scene light passing through said objective lens and the diaphragm becomes the correct value with respect to the set shutter speed and the set film sensitivity, the diaphragm aperture is prevented from being reduced according to the variation of the magnetic field of said electromagnetic coil for controlling the diaphragm aperture.

3,777,638
EXPOSURE CONTROL CIRCUITRY COMPENSATED FOR TEMPERATURE AND VOLTAGE FLUCTUATIONS

Kotaro Yata, Ikeda; Yasuhiro Nanba, and Masayoshi Sahara, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka-shi, Osaka-fu, Japan

Filed Oct. 30, 1972, Ser. No. 301,842
Claims priority, application Japan, Nov. 2, 1971, 46/86739
Int. Cl. G03b *7/08*
U.S. Cl. 95—10 CT **7 Claims**

In an electrical exposure control device for a single lens reflex camera in which the scene light of objects to be photographed which passes through the objective lens of the single lens reflex camera is received by light receiving elements the output thereof is detected by the compression circuit as a voltage proportional to the value of logarithm of the brightness of said light, said potential is stored in the storage means, the timing circuit is actuated, at the time of exposure, by the current anti-logarithmically converted from the stored voltage, and the activation circuit for terminating the exposure is included; there is disclosed that said device comprises a constant current generating circuit for preventing variation of current resulting from fluctuation of voltage in the power source, said voltage being impressed to the compression circuit; a circuit to which the current generated at the constant current generating circuit is fed, said circuit including photoconductive elements and resistors, and generating a voltage proportional to a value of logarithm of illumination of light receiving surfaces; a compression circuit connected in series to the secondly-mentioned circuit and including a bias voltage generating circuit depending upon a set value of film speed and a set value of diaphragm aperture, said compression circuit photographically calculating voltage of both circuits which is developed by output current of said constant current

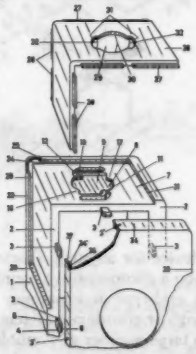


generating circuit and producing output voltage proportional to a value of logarithm of duration of exposure; a storage means for storing output voltage of said compression circuit through a switch prior to exposure; a timing circuit for producing an anti-logarithmically converted current from the stored voltage of said storage means simultaneously with the exposure, the thus produced current being impressed thereto; and an activation circuit being actuated by said timing circuit and terminating the exposure, said device being free from error which may be introduced due to a variation of characteristics of P-N functions in these circuits depending upon a variation of temperature, and part of these circuits being of an integrated circuit.

3,777,639
CAMERA CASING ASSEMBLY

Karl Heinz Lange, Ennigloh, Germany, assignor to Bolda Werka Photographische Gerate and Kunstsloff R. Gruter Kommanditgesellschaft, Westphalia, Germany

Filed Mar. 9, 1970, Ser. No. 17,708
Claims priority, application Germany, Mar. 20, 1969, P 19 14 116.3
Int. Cl. G03b *17/02*
U.S. Cl. 95—11 R **11 Claims**



A camera in which the parts of the casing are held together through interlocking connections by engagement of catch ele-

ments formed on the individual casing parts, eliminating the use of other types of connecting means, such as, screws, rivets, etc. The camera is a so-called "one-way camera" in which the parts after being assembled cannot be taken apart. In case the camera becomes defective, it is discarded. Release of the casing parts is made possible by the use of a special tool.

3,777,640

REMOTE INDICATOR FOR DIAPHRAGM SETTING OR THE LIKE

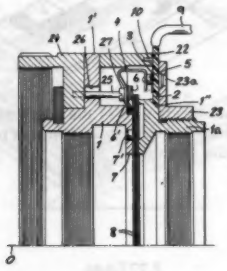
Karl-Heinz Holderbaum, Bad Kreuznach, Germany, assignor to Jos. Schneider & Co., Optische Werke (Rhld), Germany

Filed June 2, 1972, Ser. No. 259,225

Claims priority, application Germany, Feb. 9, 1972, P 22 05 976.3; June 24, 1971, P 21 31 374.6

Int. Cl. G03b *19/02*

U.S. Cl. 95—11 R **10 Claims**



A photographic objective, used for reproduction purposes in a darkroom, has an iris diaphragm whose control ring is mechanically coupled with a movable arm sweeping a contact arc inside the camera; the setting of the diaphragm can be read on an external indicator, connected to the contact arc and the arm through a cable, which includes a light box emitting filtered light to which the copying paper is insensitive. The contact arc, which may be a set of bank contacts or a continuous resistance, is carried on an insulating plate which may be removably seated in a slot of the camera housing with a plug-in connection.

3,777,641

PHOTOGRAPHIC APPARATUS FOR USE WITH PERCUSSIVELY IGNITABLE FLASH LAMPS

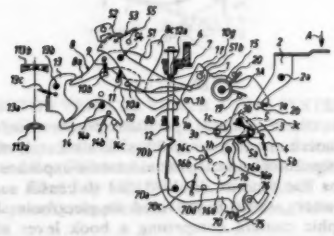
Alfred Winkler, Munich; Peter Lermann, Narring, and Guenter Fauth, Unterhaching, all of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Germany

Filed Apr. 19, 1973, Ser. No. 352,536

Claims priority, application Germany, Apr. 28, 1972, P 22 20 874.8

Int. Cl. G03b *15/04*

U.S. Cl. 95—11 L **10 Claims**



A still camera wherein a single multiple-purpose programming device is cocked in response to transport of photographic film and is held in the cocked position by the camera release which can be operated to allow the programming device to move to an uncocked position under the action of a strong spring whereby the programming device opens the shutter and causes an impeller to fire a percussively ignitable flash lamp during movement to its uncocked position. When a flash lamp or a holder for several flash lamps is detached from a socket in the camera body, the impeller is withdrawn from the path of movement of the programming device and is replaced by a braking lever which brakes the programming device during movement to uncocked position so that the force with which the programming device strikes against a stop which determines its uncocked position is controlled to avoid excessive camera shake. When the exposures are made with artificial illumination of the subject, the programming device is braked by the impeller.

3,777,642

CAMERA FOR USE WITH PERCUSSIVELY IGNITABLE FLASH LAMPS

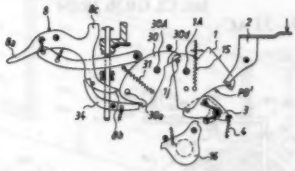
Alfred Winkler, Munich; Peter Lermann, Narring, and Guenter Fauth, Unterhaching, all of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Germany

Filed Apr. 19, 1973, Ser. No. 352,537

Claims priority, application Germany, Apr. 28, 1972, P 22 21 041.9

Int. Cl. G03b *15/04*

U.S. Cl. 95—11 L **10 Claims**



A still camera with an indexible socket for percussively ignitable flash lamps has a composite programming device with two sections which can rotate with and relative to each other between cocked and uncocked positions. One of the sections serves to open the shutter during movement to its uncocked position and the other section serves to actuate an impeller which then fires a lamp. The absence of lamps is detected by a sensing device which moves the impeller to a retracted position and simultaneously causes the impeller to move a blocking lever into engagement with the other section of the programming device so that the other section remains idle during the making of exposures in daylight. This reduces the likelihood of camera shake because the force with which the two sections strike against one or more stops when they reach their uncocked positions is not much greater than when the one section moves alone. The impeller acts not unlike a brake to oppose the movement of the other section to its uncocked position and thus reduces the impact when the two sections move simultaneously. The sections can rotate about a common axis or about separate axes.

3,777,643

AREA SOURCE OF COLLIMATED LIGHT AND SCANNING MECHANISM

Charles C. Asbelle, and Gerald K. Porter, both of Oakland, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

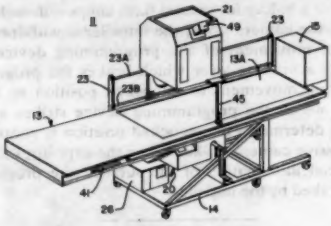
Filed Apr. 24, 1972, Ser. No. 246,979

Int. Cl. G01d *9/42*

U.S. Cl. 95—12 **10 Claims**

A method using a light source scanning and tilting table combination device for producing a silhouette pattern of a pa-

tient's extremities under weight bearing conditions. The collimated light source scanning mechanism for designing an orthopedic appliance comprises a tilting table with a transparent grid matrix and a movable area source of parallel collimated light. A silhouette of the area of interest is made by exposing the light sensitive paper located in the grid matrix with a beam of collimated light. The light source is arranged above the tilting table so that the subject may be positioned at a selected location from horizontal to vertical position.



3,777,644

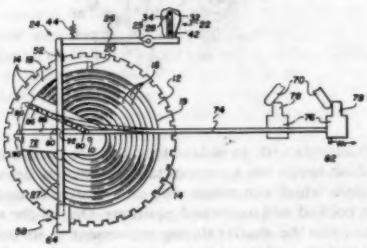
CAMERA COCKING MECHANISM

Marcus J. Millet, New York, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 10, 1972, Ser. No. 252,041

Int. Cl. G03b *19/04*

U.S. Cl. 95—31 AC **5 Claims**



A camera mechanism for cocking a shutter includes a rotating disc having a spiral groove on one face and spaced notches about its periphery. A movable arm has a follower at one end adapted to follow in the spiral groove, and the other end is coupled to the camera shutter assembly to cock the shutter as film is advanced. The follower moves in a slot provided on a guide member.

3,777,645

PHOTOGRAPHIC APPARATUS

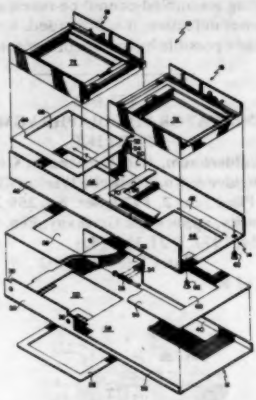
Norman W. Cutler, Braintree; John F. Pasieka, Acton, and Myron A. Seider, Needham, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 12, 1972, Ser. No. 314,417

Int. Cl. G03b *17/14*

U.S. Cl. 95—49 **20 Claims**

A photographic apparatus including a movable sliding carrier for selectively registering either a viewing screen or a film holder with the exposure aperture of a photographic camera. The viewing screen and film holder are so arranged within the carrier as to prevent any registration of the film holder with the exposure aperture while the viewing screen is in at least partial registration with the camera exposure aperture. Moreover, the photographic apparatus is so configured as to obviate the need for a movable dark slide proximate the film holder for preventing exposure of the film while the carrier is in a position in which the viewing screen is in registration with the camera exposure aperture.



3,777,646

ELECTRONIC SHUTTER FOR PHOTOGRAPHIC CAMERA

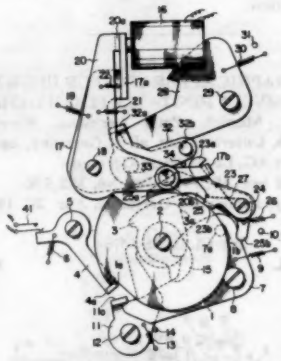
Munetaka Shimizu, Tokyo, Japan, assignor to Kabushiki Kaisha Koparu, Itabashi-ku, Japan

Filed May 19, 1972, Ser. No. 255,085

Claims priority, application Japan, May 25, 1971, 46/42005 (utility model)

Int. Cl. G03b *9/58*

U.S. Cl. 95—53 EB **2 Claims**



In order that a designed specific exposure time, for example, one-one hundred twenty-fifths of a second, may be obtained automatically in case the electronic exposure time control means has become disabled due to causes such as dissipated battery, there is provided an electronic shutter for photographic camera comprising a hook lever adapted to anchor the armature lever for a while only when the electronic exposure time control means fails to work at the time the shutter is released, and a cam member for releasing said anchored state. This electronic shutter contains a flash light

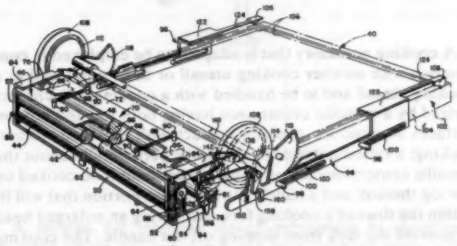
means which is rendered ready to being operative when the electronic exposure time control means is switched over to the inoperative state.

3,777,647

PHOTOGRAPHIC APPARATUS AND METHOD FOR TREATING PHOTOGRAPHIC MATERIALS WITH A LIQUID

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 23, 1972, Ser. No. 255,976
Int. Cl. G03d 5/02
U.S. Cl. 95—89 L 42 Claims



Photographic apparatus for and method of processing an exposed area of a layer of photosensitive image-recording material by confining the layer between a pair of superposed sheets and distributing a processing liquid, e.g., having a viscosity approximating that of water, between the sheets in contact with the exposed area. The liquid is introduced into a region between the sheets defined by two parallel, spaced linear regions at least equal in length to the width of the exposed area at which compressive pressure is applied to the sheets by two pairs of pressure-applying members. The sheets are held together at the lateral edges of the exposed area to prevent escape of the processing liquid from between the sheets and the two pairs of pressure-applying members are moved relative to the sheets from one end of the exposed area to the other end to permit the liquid to be absorbed into the exposed area of the photosensitive material. During relative motion of the pressure-applying members and sheets, at least one pressure-applying member of each pair is biased toward the other pair to reduce the spacing between the linear regions and maintain the liquid under pressure as it is absorbed by the photosensitive material. The processing liquid is supplied from a rupturable container attached to the sheets at one end of the exposed area and excess processing liquid overrun is collected in an absorbant trap at the opposite end of the exposed area by relieving the pressure exerted on the sheets.

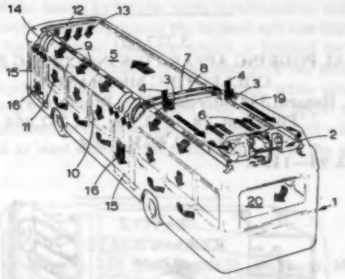
3,777,648

MOTOR VEHICLE VENTILATING SYSTEM

Joseph McGowan, Preston, and Gerald Fowler, Eccleston near Chorley, both of England, assignors to British Leyland Truck and Bus Division Limited, Lancashire, England

Filed July 12, 1971, Ser. No. 161,849
Claims priority, application Great Britain, Nov. 7, 1970, 33,765/70
Int. Cl. B60h 1/24
U.S. Cl. 98—2.04 4 Claims

A heating/ventilating system of a public service vehicle includes a plenum chamber formed in the vehicle's roof to which air is supplied by a heating/ventilating unit, the windows of the vehicle being demisted or defrosted by air escaping



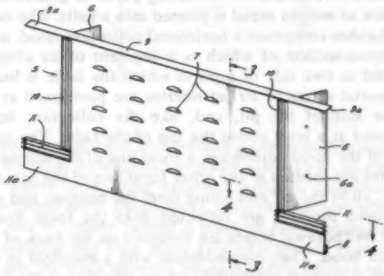
from the plenum chamber through outlets adjacent the tops of the windows.

3,777,649

FRIEZE VENT

William A. Luckey, 3043 Jefferson Ave., El Paso, Tex.

Filed Mar. 31, 1972, Ser. No. 240,214
Int. Cl. F24f 7/00
U.S. Cl. 98—37 12 Claims



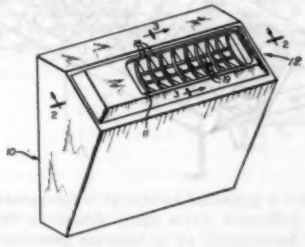
A prefabricated apparatus used for occupying the space between the roofing material and the outer walls of a building, the size of such space being dependent upon the vertical dimension of the rafters supporting the roofing material and the horizontal distance between rafters. The apparatus is provided with corrugations so that it may be adjusted for variations in the normal sizes of the space and the rafters.

3,777,650

AIR DISTRIBUTOR

Norman B. Wenig, 39 Herkimer Rd., Scarsdale, N.Y.

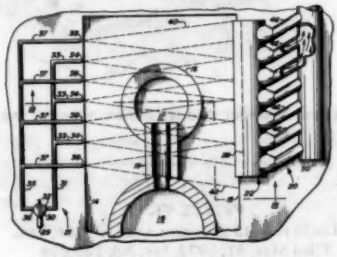
Filed Jan. 3, 1972, Ser. No. 214,862
Int. Cl. F24f 13/06, 13/08
U.S. Cl. 98—40 V 4 Claims



An air distributor for controlling the direction of air flow out of a passageway whereby the air exiting the passageway is

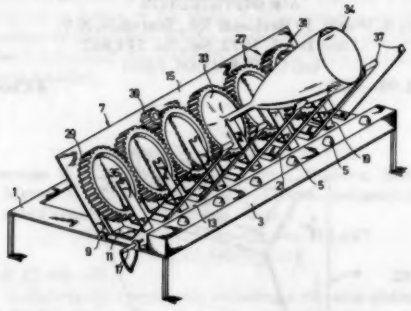
controllably deflected by a combination of axially spaced transverse vanes and angularly spaced radial vanes mounted on a rotor extending across the outlet of the passageway.

3,777,651
METAL POURING APPARATUS INCLUDING PARTICLE COLLECTING MECHANISM
Paul J. Hansen, 334 Interstate Pky., Bradford, Pa.
Filed Sept. 28, 1972, Ser. No. 292,864
Int. Cl. F23j *11/04*
U.S. Cl. 98—115 R **10 Claims**



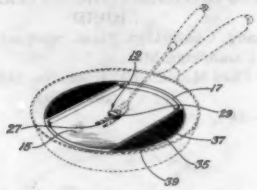
This specification discloses metal pouring apparatus which includes mechanism for collecting particles generated by explosion as molten metal is poured into a ladle. The collecting mechanism comprises a horizontal collection hood, any vertical cross-section of which is a segment of an ellipse. It is located at one side of a pit in which the ladle is located. A horizontal series of air jet nozzles are positioned at the opposite side of the pit, and, like the collection hood, are disposed at a level above the top of the ladle. The inner surface of the hood determines a focal line of the ellipse and the nozzles are located at the other focal line of the same ellipse. Thus, all of the air emanating from the nozzles, and particles entrained thereby, are reflected onto the focal line of the hood. Withdrawal hoods are mounted on the back of the collection hood. They communicate with a manifold in which a partial vacuum is generated and are effective at the focal line of the hood.

3,777,652
DEVICE FOR PROVIDING IRISH COFFEE
Emil Engel, Egerer Strasse 34, 8595 Waldsassen, Germany
Filed Aug. 9, 1972, Ser. No. 278,942
Int. Cl. A23f *1/00*; B01f *9/04*
U.S. Cl. 99—275 **9 Claims**



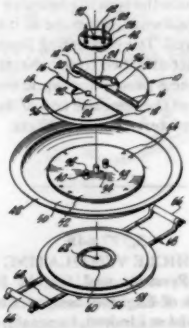
The specification describes a device for the preparation of Irish-Coffee which comprises a number of rotary plates arranged to receive glasses in which the Irish-Coffee is made.

3,777,653
COOKING ACCESSORY
Jack I. Carruth, 1416 Yale St., Fort Worth, Tex.
Filed Mar. 1, 1972, Ser. No. 230,889
Int. Cl. A47j *37/10*
U.S. Cl. 99—339 **4 Claims**



A cooking accessory that is adapted to be employed in conjunction with another cooking utensil or to be employed as a cooking utensil and to be handled with a cooking fork characterized by a metallic centerpiece having both top and bottom surfaces adapted for cooking contact with the food without sticking; a raised outer edge extending peripherally about the metallic centerpiece for retaining juices about food cooked on the top thereof; and a handle having a base portion that will fit within the tines of a cooking fork and having an enlarged head to prevent the fork from slipping off the handle. The cooking accessory can be emplaced atop meat, such as bacon, frying in a skillet to eliminate problems with curling and wasteful shrinkage, and to obtain substantially uniform cooking. On the other hand, the cooking accessory can be employed on a grill and meat, eggs, hotcakes or the like cooked on its upper surface as on the surface of a griddle. In specific embodiments, the cooking accessory has foraminous, screen-like portions at one or more of its edges exteriorly of the raised edge to allow turning the cooking accessory to inspect the food to see if it has been cooked completely, draining grease or the cooking juices from around the food for more healthful food.

3,777,654
ROASTING PAN
John Strathaus, 11835 Highwater Rd., Granada Hills, Calif.
Filed July 20, 1971, Ser. No. 164,287
Int. Cl. A47j *37/04*; A22c *17/02*
U.S. Cl. 99—419 **6 Claims**



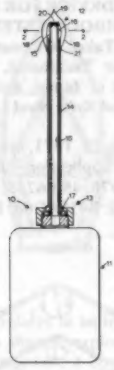
A roasting pan having a center carving section made from hardwood. This hardwood center has provision for a set of metal prongs to secure large pieces of meat to the pan. The center may also be repositioned to provide a substantially flat surface for roasting flat pieces of meat such as steak.

3,777,655

MEAT FLAVORING SYRINGE

Sheldon E. Ainsworth, 1704 Shadyside Dr. S.W., Albuquerque, N. Mex.

Filed Sept. 11, 1972, Ser. No. 288,090
Int. Cl. A23b 1/16
U.S. Cl. 99—532 10 Claims



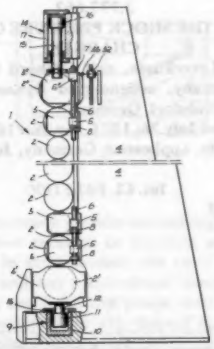
A syringe for injecting flavor substances in meat constructed of an elongated tubular stem, one or more radial apertures located in the stem proximate a first end, a lance blade of generally open elliptical shape affixed to the stem on the said first end in protective relationship to the one or more apertures and means for detachably attaching the stem at the second end to a compressible flavor substance container.

3,777,656

CALENDER AND METHOD OF OPERATING THE SAME

Gernot Muller, Reutlingen, Germany, assignor to Bruderhaus Maschinen G.m.b.H., Reutlingen, Germany

Filed Feb. 17, 1972, Ser. No. 227,222
Int. Cl. B30b 3/04
U.S. Cl. 100—47 12 Claims



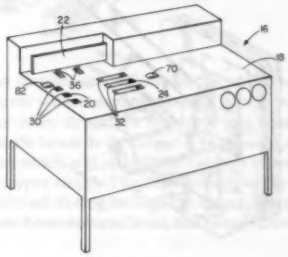
A calender and a method of operating the same by means of a pair of upper hydraulic units the pistons of which are hydraulically movable in both directions in their cylinders. During the normal operation of the calender, these pistons exert a loading pressure in the downward direction upon the vertically slidable bearings of the highest calender roll, while the bearings of the lowest roll rest in a fixed position on the piston rods of a pair of lower hydraulic units which are hydraulically movable only in the upward direction up to fixed stops by a hydraulic pressure in their cylinders which is at least equal to a total of the weight of all of the rolls and of the loading pressure upon the highest roll. If it becomes necessary to separate the rolls quickly from each other, the pressure in the cylinders of the lower hydraulic units is released so that each of the rolls with the exception of the highest roll can then drop by gravity for a certain distance which is limited by stops, while preferably the direction of movement of the pistons of the upper hydraulic units is reversed so that, while the lower rolls will drop by gravity, the piston rods of the upper pistons which are secured to the bearings of the highest roll will draw this roll and at least some of the following rolls in the upward direction.

3,777,657

STACK PACKER

Roger C. Crandlemire, 159 Washington St., Duxbury, Mass.

Filed May 25, 1972, Ser. No. 256,775
Int. Cl. B30b 15/14
U.S. Cl. 100—49 3 Claims



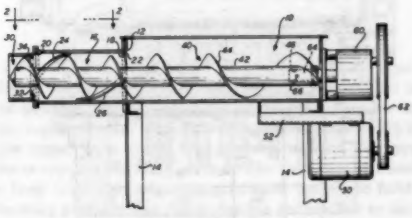
Apparatus for aligning and holding a compressible stack of flat articles while the stack is being surrounded with an endless band or sleeve or is being enclosed within a container, includes movable gates which move upwardly successively one in front and the other behind a stack of flat articles moved along a tabletop and then move relatively toward each other to compress the stack between the gates while a sleeve or container is placed around the stack. The gates are then retracted. The motions follow one another in timed sequence.

3,777,658

APPARATUS FOR COMPRESSING MATERIAL

Heinz Vosskuhler, Auburn, N.Y., assignor to Jeffrey Heinz Manufacturing Co., Inc., Auburn, N.Y.

Filed Jan. 6, 1972, Ser. No. 215,784
Int. Cl. B30b 9/14
U.S. Cl. 100—98 7 Claims



Material compression apparatus including a rotable auger provided with a variable pitch screw extending through a hopper for receiving material to be compressed, a material compression and shredding chamber and a material discharge chamber. The material compression and shredding chamber is provided with raised counter spirals for cooperating with the

screw to shred and compress the material. A portion of the entrance shoulder to the material compression, and shredding chamber and the entrance shoulder to the material discharge chamber, are provided with predetermined angles for retarding the advancement of the material sufficiently to achieve material compression, and yet not retarding the material sufficiently to preclude advancement of the material.

3,777,659

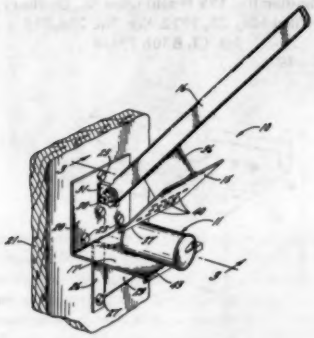
CAN CRUSHER

Hugh V. McCarten, 2141 Crittenden, Beloit, Wis.

Filed Aug. 10, 1972, Ser. No. 279,708

Int. Cl. B30b *7/00*

U.S. Cl. 100—233 **7 Claims**



The crusher includes a swingable lever carrying a press plate which folds the closed end portion of the can outwardly over the main body of the can and smashes the main body downwardly as the lever is swung downwardly. By swinging the lever downwardly through an additional stroke, the press plate may be used to flatten the folded portion downwardly against the main body of the can.

3,777,660

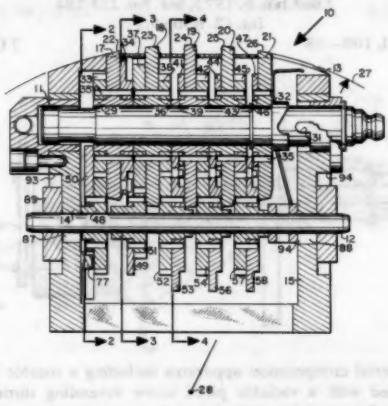
ROTARY PRINTER FOR NUMBERING INCLUDING GENERAL WHEEL DRIVE MEANS

Joachim F. Otto, Point Pleasant, N.J., assignor to The Anaconda Company, New York, N.Y.

Filed Nov. 18, 1971, Ser. No. 200,102

Int. Cl. B41l *45/06*

U.S. Cl. 101—77 **6 Claims**



A printing head on a rotary numbering machine for printing footages on cables and the like comprises one axis for printing disks and another, parallel, axis for auxiliary geneva mechanisms. For the first two disks geneva wheels are mounted on the auxiliary axis and geneva cams on the disk axis while for later disks the geneva cams are on the auxiliary axis and the geneva wheels on the disk axis. Two sets of alignment holes are provided, one through the elements on each axis.

3,777,661

METHOD AND DEVICE FOR MARKING SHEETS THROUGH STENCILS

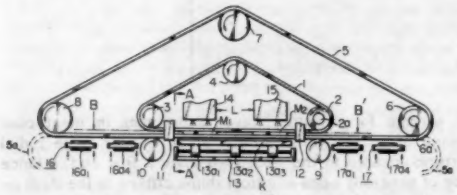
Hideo Aiko, Kobe; Takao Okamoto, Kakogawa; Eiji Abe, Tamaki; Kazunobu Tsukihashi, Yokohama, and Koichi Yamashita, Ise, all of Japan, assignors to Shinko Electric Co., Ltd., Tokyo and Kobe Steel Ltd., Kobe-shi, Hyogo-ken, both of Japan

Filed June 28, 1971, Ser. No. 157,107

Claims priority, application Japan, June 29, 1970, 45/56775; July 29, 1970, 45/66755; Oct. 21, 1970, 45/92511

Int. Cl. B41f *15/08;* **B41n** *1/24*

U.S. Cl. 101—114 **6 Claims**



A sheet to be marked is delivered to a marking station in succession by a second conveyor. Stencils for desired marks are prepared at a punching station and forwarded by a first conveyor to the marking station and registered on the sheet to be marked. Pigment sprayer means in the marking station directs pigment jets onto the stencils for urging the stencils to the sheet, so as to print the marks carried by the stencils onto the sheet by the pigment jets.

3,777,662

EFFECT OF THE SHOCK PRESSURE OF EXPLOSIVE CHARGES

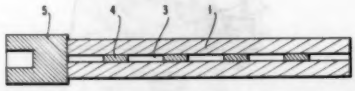
Paul Lingens, Leverkusen, and Gerhard Martin, Troisdorf, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed July 26, 1971, Ser. No. 166,013

Claims priority, application Germany, July 24, 1970, P 20 36 726.4

Int. Cl. F42d *1/00*

U.S. Cl. 102—23 **14 Claims**



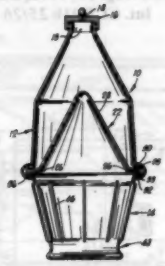
An explosive charge and method for increasing detonative percussion in which the explosive is provided with cavities, gas, or fissures which permit the "advance ignition" of the explosive. Preferably, the explosive is cylindrically shaped with a through-axial core. The bore may include explosive or inert baffles. Also the bore may be provided with a fuze train of explosives.

3,777,663

SHAPED CHARGE ENCLOSURE APPARATUS

Claude H. Brown, Arlington, Tex., assignor to Jet Research Center, Inc., Arlington, Tex.

Filed June 22, 1972, Ser. No. 265,372
Int. Cl. F42b 3/08
U.S. Cl. 102—24 HC 6 Claims



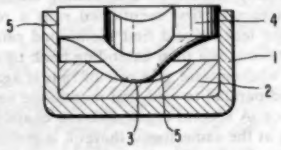
The present invention relates to an improved enclosure apparatus for containing a shaped explosive charge which includes a top enclosure member, a bottom standoff member and a shaped liner positioned therebetween. The liner, enclosure member and standoff member each include annular flange portions and means for clamping the flange portions together are attached thereto so that a fluid tight seal between the liner, enclosure member and standoff member is provided.

3,777,664

ANVIL FOR PERCUSSION PRIMER

Heinz Gawlick, Furth/Bay; Hellmut Bendler, Erlangen-Spardorf, and Ernst Jensen, Furth/Bay, all of Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

Filed Feb. 1, 1971, Ser. No. 111,275
Claims priority, application Germany, Jan. 31, 1970, P 20 04 506.1
Int. Cl. F42c 19/08
U.S. Cl. 102—45 10 Claims



An anvil for percussion primers comprising an annular disk having at least two recesses or cut-outs at the periphery thereof. As seen in cross-section, the anvil tapers approximately conically and has a cylindrical outer surface in the zone of one of its end faces and passes over into an annular surface at right angles to the axis thereof in the zone of the other of its end faces.

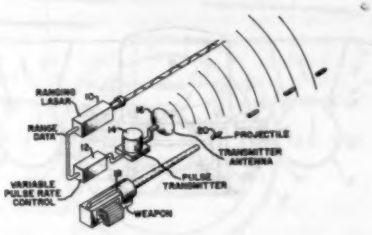
3,777,665

FUZE ACTUATING SYSTEM

Richard T. Ziemba, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Division of Ser. No. 843,478, July 22, 1969, Pat. No. 3,714,898. This application Aug. 3, 1972, Ser. No. 277,562
Int. Cl. F42c 13/04, 15/04, 11/00
U.S. Cl. 102—70.2 P 1 Claim

An electronic, digital, time fuze, has a time base which is introduced over a radar command link at a rate which is inversely proportional to the desired projectile flight time. A target following ranging device, such as a ranging laser, provides target range information to a pulsed radar transmitter. The range signal from the ranging device controls a variable pulse rate control unit which in turn adjusts the transmitter pulse rate to a value inversely proportional to the target range. The transmitter is fixed to the weapon system and radiates in the direction of the projectile flight path. Each projectile includes a fuze actuating circuit consisting of an antenna, an r.f. detector, a fixed-set counter and a firing circuit. At launch, the fuze actuating circuit within each projectile becomes actuated a short distance after departure from the gun muzzle. As the projectile travels towards its target it receives a series of r.f. pulses at a rate which will just fill the counter when the projectile is at the proper range. The counter within the fuze counts the pulses received during its flight to target. When the fixed-set number has been accumulated, the firing circuit detonates the payload.

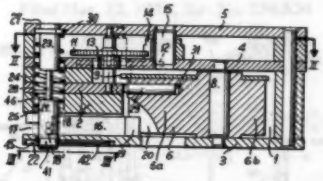


3,777,666

SAFETY DEVICE FOR A GYRATORY ROCKET MISSILE

Rene Morel, Geneva, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

Filed Oct. 28, 1971, Ser. No. 193,256
Claims priority, application Switzerland, Nov. 3, 1970, 16257/70
Int. Cl. F42c 15/26
U.S. Cl. 102—80 1 Claim



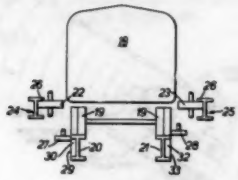
A safety device for a gyratory rocket missile of the type with a primer support centrifugally pivotable from a safe to an armed position and centrifugally releasable means for securing the support in the safe position, comprises an axially slidable pin urged by a spring to a position locking the securing means in support-securing positon. The two ends of a resilient open loop releasably engage a groove in the pin to hold it in the locking position and, when the pin moves due to an axial acceleration upon firing the missile so as to free the securing means, the ends of the loop come to bear against a shoudler of the pin to prevent return thereof. Once the support regulated by a delay mechanism reaches the armed position, a finger slidably mounted in an outwardly opening radial housing in the primer support moves out of its housing to lock the support in position.

3,777,667

TRANSPORTATION MEANS

Francis Cyril Perrott, The Manor House, South Cerney, Cirencester, England

Continuation of Ser. No. 779,977, Nov. 29, 1968, abandoned.
This application Oct. 19, 1971, Ser. No. 190,627
Claims priority, application Great Britain, Aug. 21, 1968, 39,883/68
Int. Cl. B61b 13/08, 1/00
U.S. Cl. 104—88 10 Claims



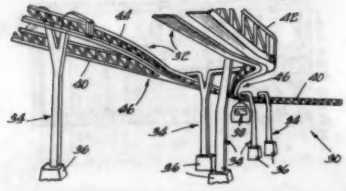
Means of transportation comprise a vehicle and guidance means for the vehicle. The guidance means include a plurality of stationary guide members which respectively extend parallel to alternative routes for the vehicle, which routes either branch, or join, or both. A plurality of follower members are separately mounted on the vehicle and individually engageable with the guide members, and means carried by the vehicle enable any one of the follower members to be engaged with the corresponding guide member whereby to select and cause the vehicle to follow the route corresponding to the guide member engaged.

3,777,668

MONORAIL SWITCHING DEVICE

Robert W. Corey, c/o Monarch Inc., 2700 Oakland Ave., Garland, Tex.

Division of Ser. No. 84,274, Oct. 27, 1970, Pat. No. 3,702,590.
This application July 24, 1972, Ser. No. 274,338
Int. Cl. E01b 25/26
U.S. Cl. 104—105 3 Claims



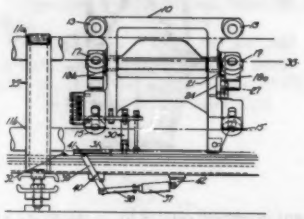
A vehicle switching arrangement comprises an overhead monorail guideway that includes a mainline section and a diverging section merging with the mainline section to define a switching station. In addition, a bogie unit is arranged for rollable transport along the guideway and includes port and starboard main wheels rollably engaging the guideway. The bodie unit also includes a guide arrangement for selectively acting against the guideway to load either the port or the starboard main wheels in excess of the normal vehicle load thereof for establishing a vehicle heading through the switching station. Furthermore, stationary fail-safe cams are provided on the guideway to cooperate with cam followers carried by the bogie unit for ensuring safe transit through the switching station in the event of malfunction.

3,777,669

PARTS CONVEYOR PALLET AND MEANS FOR SUPPORTING SAME ON AN INITIAL PAIR OF RAILS AND SWITCHING SAME TO A SECOND PAIR OF RAILS

George T. Lott, Wyoming, and Francis H. Little, Cincinnati, both of Ohio, assignors to Lott Tool Company, Cincinnati, Ohio

Division of Ser. No. 139,672, May 3, 1971, Pat. No. 3,717,103.
This application Aug. 16, 1972, Ser. No. 281,126
Int. Cl. E01b 25/26
U.S. Cl. 104—130 5 Claims



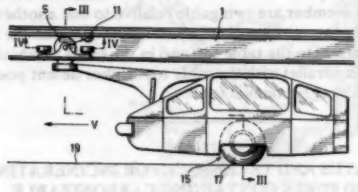
A pallet for conveying parts through a succession of work stations. The primary support for the pallet comprises a pair of vertically aligned tubular rails. The pallet is support on these rails by a pair of upper rollers mounted on said pallet and riding on the upper rail and a pair of lower rollers mounted on said pallet and riding on the lower rail along with a third pair of intermediate or clamping rollers, shiftably mounted on said pallet, which cooperates with the upper rollers to clamp the pallet to the upper rail. In this manner the pallet is cantilevered from the top rail. The pallet is driven by means of a downwardly extending arm having a spring loaded friction plate which frictionally engages the top of a flat segmented (crescent) chain disposed beneath the pallet and continuously driven by conventional means. The first mentioned rails are disposed in a continuous path. Each work station is mounted to one side of said path. For each work station there is a side pair of vertically aligned rails extending closely adjacent to and parallel to said first mentioned rails a relatively short distance, then leaving said first mentioned rails to lead to a said work station, and then extending back to said first mentioned rails wherein said side pair of rails is again closely adjacent to and parallel to said first mentioned rails a relatively short distance. A second chain, like the chain first described and running at the same speed thereof, is positioned beneath said side pair of rails at the same level as said first chain. The said plate extends beyond said first chain a distance sufficient to engage said second chain when said pallet is brought into proximity with said side pair of rails. Said pallet has mounted thereon a second pair of upper rollers, and a second pair of lower rollers, disposed to engage said side pair of rails when the pallet is brought to that position wherein the side pair of rails is parallel to said first mentioned rails. At this last mentioned point means are actuated to disengage said third pair of rollers from clamping engagement with said first mentioned upper rail while immediately causing a similar pair of clamping rollers to engage the upper of said side pair of rails whereby said pallet is then cantilevered from said side pair of rails by virtue of said second pair of upper rollers, said similar pair of clamping rollers and said second pair of lower rollers. Continued movement of the chains will cause the pallet to move along on the side rails to the work station. Similarly the pallet may be placed back on the first mentioned rails when the side rails are parallel thereto and means are actuated to again reverse the positions of said first mentioned, and said similar, clamping rollers.

3,777,670

SINGLE-DIRECTIONAL TRACK-GUIDED VEHICLE

Ernst Blochlinger, Neuhausen au Rheinfall, Switzerland, assignor to Schweizerische Industrie-Gesellschaft, Neuhausen a. R., Switzerland

Filed Sept. 17, 1971, Ser. No. 181,506
Claims priority, application Austria, Sept. 24, 1970, 8631/70
Int. Cl. B61b *13/00*
U.S. Cl. 104—246 10 Claims



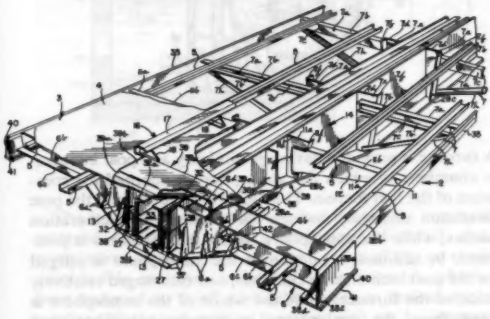
A road supported, track guided vehicle: The vehicle has a body with a center of gravity and has a road wheel assembly near the center of gravity, which carries the load of the vehicle body. A rail guided rail wheel assembly is connected through a rigid arm by an articulated connection to the vehicle body. The arm extends forwardly of the body and serves to vertically position and to guide the vehicle. Electric power may be drawn through the wheel assembly.

3,777,671

RAILROAD FLAT CAR

Roy M. Miller, Highland; Marvin Stark, Michigan City, and William R. Shaver, Munster, all of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Division of Ser. No. 39,683, May 20, 1970, Pat. No. 3,659,724.
This application July 22, 1971, Ser. No. 165,298
Int. Cl. B61f *1/02*
U.S. Cl. 105—420 1 Claim



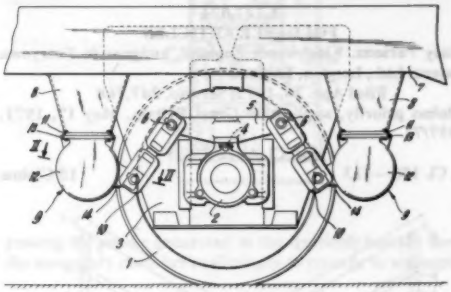
In a cushioned underframe railroad flat deck car, a bolster and crossbearer construction of cross elements extending between each side sill and the fixed center sill and having vertical truss means on the sides of the fixed sill tying the cross elements to the fixed sill, a center plate under the fixed sill tying the bolster cross elements together and a transverse transfer channel member forming a shear box with the deck and tying the bolster cross elements together, sub-cross means under the fixed sill tying the outboard bolster cross elements together, reinforcement about the fixed sill at the fish belly transition section of the fixed sill, and fixed longitudinally vertical cushion key stops on the top and bottom inside portions of the fixed sill and sliding key stop means in the form of horizontal crosshead means on the sliding insert sill acting as cushion stop means at the cushion pocket.

3,777,672

RAILWAY CAR SUSPENSION

Felix Schneider, Netphen Eckmannshausen, Germany, assignor to Rheinstahl AG, Kassel, Germany

Filed Dec. 20, 1971, Ser. No. 210,058
Claims priority, application Germany, Dec. 19, 1970, P 20 62 797.8
Int. Cl. B61f *3/00, 5/30*; F16f *1/48*
U.S. Cl. 105—453 11 Claims



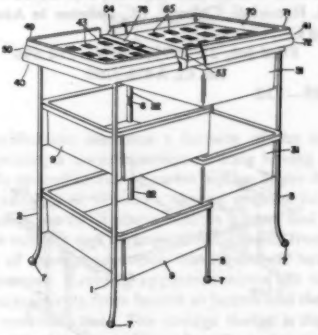
A torsional spring suspension for vehicles particularly an axle and cradle suspension for rail vehicles, comprises a linkage system extending between a supporting bracket on the undercarriage of the vehicle to the axle bearing housing which includes a spring element made up of a plurality of concentrically and alternately arranged metal and rubber or elastic material sleeves. The spring element includes at least one outer and one inner metal sleeve and the sleeves which are concentrically arranged are jointed together through the intermediate elastic sleeves. One of the sleeves is fixed to a housing by a non-rotatable connection and the other carries a swivel arm which provides the articulation for the support of the axle bearing.

3,777,673

SECURITY TOP OR GUARD FOR INFANT'S DRESSING TABLE OR THE LIKE

Lawrence Blazey, Bay Village; David Silverstrom, Lyndhurst, and Elmer Rocker, Shaker Heights, all of Ohio, assignors to Century Products, Inc., Cleveland, Ohio

Filed Mar. 22, 1972, Ser. No. 236,836
Int. Cl. A47b *17/00, 57/00*
U.S. Cl. 108—27 8 Claims



A top or guard for an infant's dressing table or dresserette is provided which is so designed and constructed as to reduce or minimize the possibility of the infant rolling or falling off the table. The top is of such construction that it can be shortened

to conform in dimensions or area with the table or dresserette when folded or closed. It comprises sections, one of which is telescopically movable in relation to the other, with the sections provided with means for limiting movement of one section relatively to the other. Other features include track means for maintaining the sections in alignment during movement relatively to each other, and safety belt means secured to one of the sections.

3,777,674

FOLDABLE ARTICLES

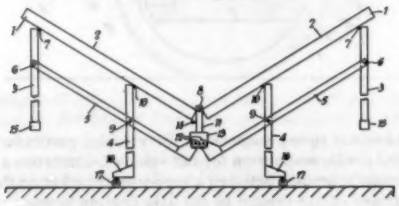
Rodney Parsons, Kingswood, England, assignor to Entryown Patents Ltd., London, England

Filed Apr. 26, 1972, Ser. No. 247,768

Claims priority, application Great Britain, May 17, 1971, 15,357/71

Int. Cl. A47b 3/083

U.S. Cl. 108—113 15 Claims



A foldable article having a generally planar surface, for example a table-tennis or other table, comprises two halves which are pivotable with respect to one another so as to fold up into a position in which the halves lie against one another. A respective beam is provided below each half, and the beams are pivotally connected to one another such that pivotal movement of one half constrains the other half to move to an equal extent in an opposite sense. The pivot point of the halves and that of the beams are rigidly connected. Each half is supported by a respective leg which is pivotally connected to its half and to a beam. The pivot points of the halves, the beams, the legs with the beams and the legs with the halves define a respective parallelogram below each half. On folding up the article, the legs of each half move towards one another over a supporting surface.

3,777,675

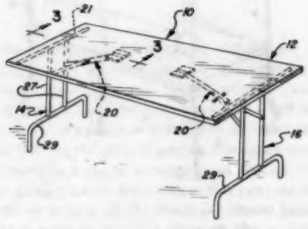
FOLDING TABLE LEG BRACE CONSTRUCTION

Tadeusz J. Hanusiak, Chicago, Ill., assignor to Amtab Manufacturing Co., Chicago, Ill.

Filed July 21, 1972, Ser. No. 274,096

Int. Cl. A47b 3/00

U.S. Cl. 108—132 9 Claims



A folding leg for a table top has a bracing structure which is comprised of a cylindrical tubular member and a pair of juxtaposed arcuate cross section arms resiliently clamped on a swivel to the opposite sides of the tubular member adjacent one end of said tubular member with the tubular member nesting in the concave surfaces of the arms, these latter surfaces facing one another. The arms have extensions which diverge so that the arms and their extensions together form a generally wishbone structure, the ends of the extensions opposite the arms being hingedly connected to said folding leg which is pivoted adjacent one end of the table top. The second end of the tubular member is pivoted to the bottom of the table top spaced inwardly from said one end. The wishbone structure and tubular member are swingable relative to one another and will detent in two positions 180° apart in one of which the folding leg is normal to the table top and in the other of which the folding leg is parallel with the table top. Either detent position can be overcome by manual force.

3,777,676

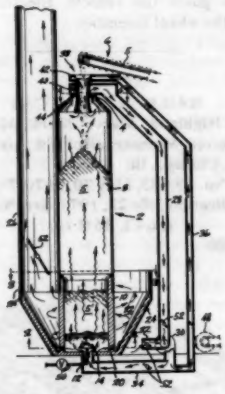
APPARATUS AND TECHNIQUE FOR INCINERATING SOLID FUELS CONTAINING CARBONIZABLE MATERIAL

William S. Lagen, 9931 Lake Washington Blvd. N.E., Bellevue, Wash.

Filed July 31, 1972, Ser. No. 276,820

Int. Cl. F23g 7/00

U.S. Cl. 110—8 R 35 Claims



A furnace is provided having preliminary and post incineration chambers in which the atmosphere is adapted for combustion of the fuel therein. The fuel is introduced into the post incineration chamber through the preliminary incineration chamber, while the atmosphere within the chambers is pressurized. In addition, a portion of the atmosphere is purged from the post incineration chamber, and discharged relatively outside of the furnace, while the whole of the atmosphere is purged from the preliminary incineration chamber, and discharged into the post incineration chamber.

3,777,677

INCINERATOR

Syed Aejaz Ali, and Orval Austin Doherty, both of Shelbyville, Ind., assignors to General Electric Company, Indianapolis, Ind.

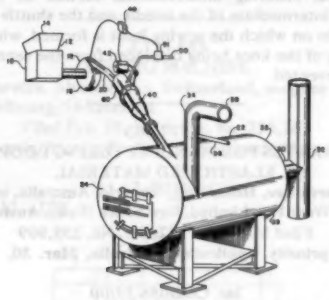
Filed Sept. 13, 1972, Ser. No. 288,523

Int. Cl. F23g 7/00

U.S. Cl. 110—8 R 10 Claims

An incinerator for burning waste material having a combustion chamber comprising spaced end walls and a side wall through which a mixture of waste material and air is vortically moved and burned. The incinerator combustion chamber in-

cludes a tangentially directed inlet conduit means for feeding a mixture of waste material and air under pressure from a blower into the chamber, and an exhaust flue to vent combustion gases from the chamber. The inlet conduit means is



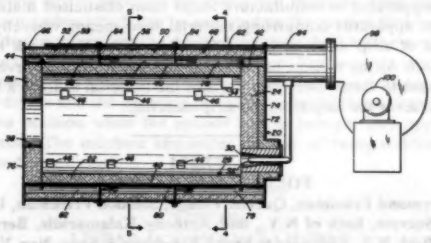
provided with a valve means intermediate the combustion chamber and blower for closing off the conduit when the blower is not operational, and means are provided for introducing cooling air to said valve means in the inlet conduit.

3,777,678

CYCLONIC TYPE FUEL BURNER

Kenneth V. Lutes, Escondido; James E. Lander, San Clemente; Vincent J. Shanahan, Escondido, and Richard G. Mills, Solana Beach, all of Calif., assignors to Macmillan Bloedel Ltd.

Filed June 14, 1971, Ser. No. 152,541
Int. Cl. F23g 5/06
U.S. Cl. 110—8 R **10 Claims**



The invention is directed to a fuel burner for combustible material, the burner having a horizontally disposed, circular combustion chamber into which all types of dry or semi-dry combustible material, including waste material, which has been reduced to small particulate size, or various types of combustible luquid wastes, together with air for supporting combustion, are injected tangentially into the combustion chamber. The invention is also directed to the method of burning combustible material and to the method of providing heat energy.

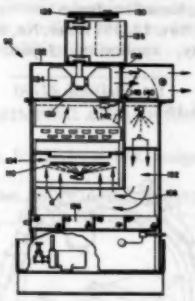
3,777,679

INCINERATING PROCESS

Zygmunt J. Przewalski, 22 Brewster Rd., Windsor, Conn.

Filed Apr. 17, 1972, Ser. No. 244,527
Int. Cl. F23g 7/00
U.S. Cl. 110—8 A **2 Claims**

An incinerating system for recovering copper wire following the burning of the insulation therefor as combustible waste while simultaneously insuring against wire overheating including the steps of: first burning the insulated wire in an ignition chamber, second preheating the secondary chamber, and third exploiting the fuel generated in the ignition chamber for maintaining the temperature of the secondary chamber while



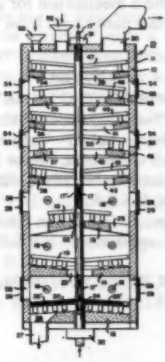
passing the smoke generated in the ignition chamber through the secondary chamber preliminary to passage to atmosphere.

3,777,680

FURNACE FOR COMBINED INCINERATION OF RUBBISH, GARBAGE, AND SEWAGE SLUDGE

John C. Eck, Convent, N.J., assignor to Wilputte Corporation, Murray Hill, N.J.

Filed June 27, 1972, Ser. No. 266,688
Int. Cl. F23g 3/02
U.S. Cl. 110—12 **7 Claims**



The specification discloses a furnace of the multihearth type, comprising a lower combustion zone having a plurality of vertically spaced annular hearths and an upper drying zone having a plurality of vertically spaced annular hearths. The central area of the drying zone hearths is open and provides a passage for rubbish and garbage to fall directly from a hopper at the top of the furnace upon the uppermost hearth in the combustion zone. Rabbling apparatus moves the rubbish and garbage progressively from hearth to hearth and thence in ash form to a removal chute. The sewage sludge is deposited on the uppermost of the drying zone hearths and moved progressively downward by rabbling apparatus in a zig-zag path from hearth to hearth and then falls in a dry state to the uppermost hearth of the combustion zone, where it is incinerated along with the garbage and rubbish, and then removed in ash form via the removal chute. A forced air system for cooling the rabbling apparatus is also provided.

3,777,681

SEAMING METHOD AND APPARATUS FOR GORELESS PANTY-HOSES

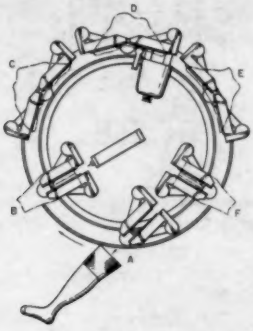
Teruyuki Horita, Osaka, Japan, assignor to Takatori Machinery Works Ltd., Nara-ken, Japan

Filed Nov. 12, 1971, Ser. No. 198,374

Claims priority, application Japan, Nov. 19, 1970, 45/102365

Int. Cl. D05b *21/00*

U.S. Cl. 112—121.15 17 Claims



A pair of stocking materials are sewn and combined into a goreless panty-hose on a circulating or reciprocating template unit which has a pair of template assemblies for upholding and spreading the stocking materials mounted thereon and is accompanied with a cutter assembly for partly slicing the stocking materials upheld by the template assemblies, a sewing machine for seaming together the stocking materials in spread disposition and a mechanism for automatically removing the finished goreless panty-hose from the template unit.

3,777,682

MACHINE FOR SEWING UP NETTING WEBS

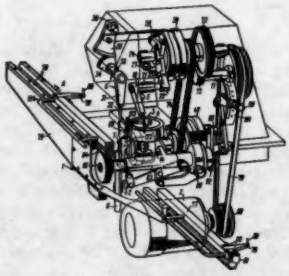
Khugo Gustavovich Tooming, ulitsa Yakhu, 8, kv. 24; Leopold Yakobovich Kjulvya, bulvar Vabaduse, 179/9, kv. 1; Eduard Andreevich Gorshenin, bulvar Karla Marxa, 64, kv. 26, and Arnold Yanovich Nevalins, ulitsa Eduard Vilde, 91, kv. 67, all of Tallin, U.S.S.R.

Filed Nov. 30, 1971, Ser. No. 203,325

Claims priority, application U.S.S.R., Nov. 30, 1970, 1494268

Int. Cl. D05b *35/00, 39/00, 61/00*

U.S. Cl. 112—121.15 6 Claims



In the machine the device for forming a sewing knot includes a shuttle with a spool supporting thereon a supply of the sewing thread; a mechanism for withdrawing the thread from the spool and forming a thread loop; a mechanism with a needle for drawing the thread through the netting webs being sewn up. The loop passes around shuttle and forms a sewing knot that is subsequently tightened about the edges of the netting webs. The machine incorporates means for intermittent feeding of the netting webs toward the sewing knot forming device, ensuring unidirectional motion of the webs. Mounted intermediate of the needle and the shuttle is a seam guiding pin on which the sewing knot is formed, whereby the possibility of the knot being displaced from the seam forming area is prevented.

3,777,683

APPARATUS FOR MANUFACTURING LOOPS OF ELASTICISED MATERIAL

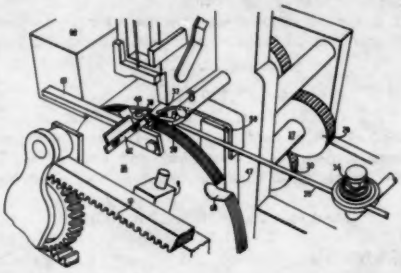
Harold Barry Lee, Heidelberg, Victoria, Australia, assignor to Bond's Wear Pty. Limited, New South Wales, Australia

Filed Mar. 28, 1972, Ser. No. 238,909

Claims priority, application Australia, Mar. 30, 1971, PA 4452

Int. Cl. D05b *23/00*

U.S. Cl. 112—121.27 5 Claims



Apparatus to manufacture loops from elasticised material. The apparatus comprising material feed means whereby an end of strip material is transferred to a rotating work head which forms a loop of material and securing and severing means to fasten overlying parts of the material to form a loop and sever the loop from the strip material.

3,777,684

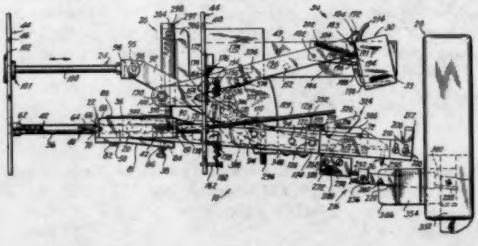
FOLDING MECHANISM

Raymond Friedman, Queens Village; Sheldon Friedman, Lake Success, both of N.Y., and Anthony Kalamaridis, Bergenfield, N.J., assignors to Frank Friedman & Sons, New York, N.Y.

Continuation-in-part of Ser. No. 157,963, June 29, 1971. This application June 23, 1972, Ser. No. 265,785

Int. Cl. D05b *35/10*

U.S. Cl. 112—152 13 Claims



Apparatus primarily powered by a single linear motor for grasping the ends of a length of ribbon or other flexible

material, folding the material to a generally U-shaped configuration with the ends tucked generally inwardly to form, for example, a garment seam cover and simultaneously moving the material along a generally L-shaped path to a sewing location with the apparatus being controlled and synchronized primarily from movement of the motor and linkages driven thereby.

3,777,685

SEWING MACHINE

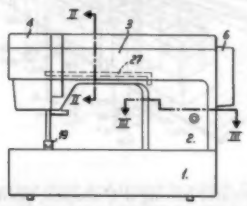
Olindo Baruffa, Aire-Geneva, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

Filed Feb. 29, 1972, Ser. No. 230,263

Claims priority, application Switzerland, Mar. 11, 1971, 3568/71

Int. Cl. D05b *69/02*

U.S. Cl. 112—220 2 Claims



The frame of the machine comprises a base, a column, an upper arm ending in a needle-bearing head, and a lower part containing a cloth transport actuating mechanism. The frame houses a main drive shaft for the machine mechanism and an electric motor. The needle-bearing head includes a presser foot control device movable between an upper and a lower position above the cloth transport element. There is a coupling device between the motor and the main drive shaft and a member which can be actuated by the presser foot control device to prevent the drive of the main shaft by the motor when the presser foot is in upper position. The member is constituted by a mechanical linkage between the presser foot control device and the coupling device to bring the latter into inactive position when the presser foot is brought into upper position. The machine eliminates the risk of being suddenly started by accident.

3,777,686

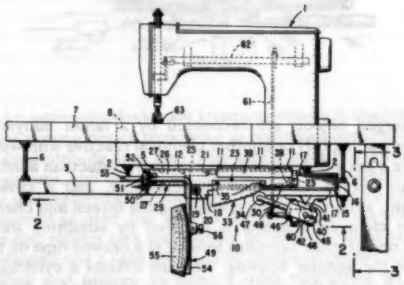
LINEAR ACTION KNEE LIFTERS

Joseph C. Hage, New Shrewsbury, N.J., assignor to The Singer Company, New York, N.Y.

Filed June 30, 1972, Ser. No. 267,847

Int. Cl. D05b *29/02*

U.S. Cl. 112—237 6 Claims



A knee shift for a sewing machine is disclosed which converts linear motion of a carriage having a kneepad adjustably attached thereto to rotary motion of a rockshaft; which can be used, through suitable linkage and leverage, to actuate an intermittently operating mechanism as for example a presser foot lifter. Two modifications are shown including a ramp and cam follower arrangement wherein the ramp cam surface may be shaped to provide a uniform actuating force with, for example, any given presser lifting device.

3,777,687

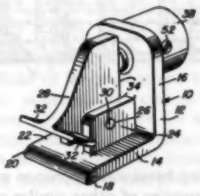
SHEET METAL CRIMPING ATTACHMENT FOR IMPACT GUN

William H. Colman, Jr., Jackson, Mo., assignor to Lenco, Inc., Jackson, Mo.

Filed Oct. 26, 1971, Ser. No. 192,158

Int. Cl. B21d *19/02*

U.S. Cl. 113—54 7 Claims



A support base defining a generally planar abutment surface and having an abutment member pivotally supported therefrom for oscillation relative to the base. The abutment member includes an arcuate surface extending about the axis of oscillation of the abuement member and including adjacent longitudinally spaced portions spaced progressively further from the axis of oscillation of the abutment member and progressively moveable into closer proximity with the abutment surface of the base in response to pivotal movement of the abutment member in one direction so that a clamping or crimping force may be directed upon a workpiece disposed between the abutment member's arcuate surface and the abutment surface of the base when the base is supported from the housing of an impact gun having its reciprocal impact member disposed for engagement with the abutment member.

3,777,688

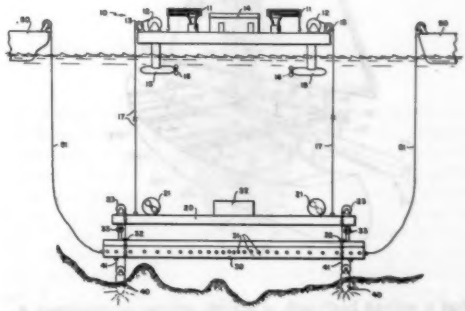
METHOD AND APPARATUS FOR EMPLACEMENT OF LONG BEAMS IN RUGGED SEA BOTTOM AREAS

Alfred E. Melhose, Blairstown, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 25, 1970, Ser. No. 48,783

Int. Cl. B63b *35/00*; E02b *17/00*

U.S. Cl. 114—0.5 5 Claims



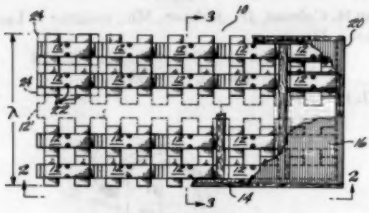
A method and apparatus for accurate emplacement of mechanical long beams, such as those incorporating acoustic transducers, in rugged sea bottom areas.

3,777,689

FLOATING BREAKWATER PONTOON

John O. Olsen, Lynnwood, and Gerrit A. Visser, Edmonds, both of Wash., assignors to Reid, Middleton & Associates, Inc., Edmonds and Poly Sintering, Inc., Seattle, both of Wash.

Filed Aug. 28, 1972, Ser. No. 284,454
Int. Cl. B63b *35/34*
U.S. Cl. 114—.5 F 6 Claims



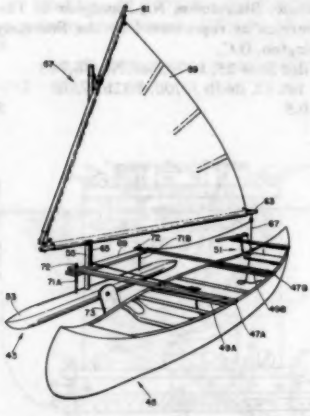
A low cost floating breakwater pontoon module adapted to nest with a large number of other similar pontoon modules; the modules preferably secured by structural members in an elongated rectangular array. The modules are hollow thin-walled sinter molded plastic pontoons which have unique indented peripheries such that when nested together in the breakwater array they will create a grid pattern of walls and openings extending into the upper portion of the wave to dissipate wave action by interference with the movement of fluid in the orbital flow under the wave crest.

3,777,690

SAILING OUTRIGGER FOR SMALL WATERCRAFT

William Wilson Garber, 6501 Hagueman Dr., Richmond, Va.

Filed Dec. 23, 1971, Ser. No. 211,187
Int. Cl. B63h *9/00*
U.S. Cl. 114—39 6 Claims



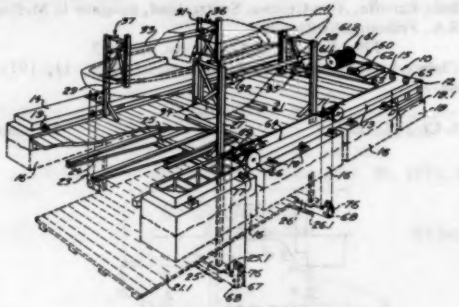
A small watercraft such as a canoe or the like is provided with a stabilizing outrigger which supports a sail-carrying mast. The sailing outrigger may include a lateral plane, and/or a rudder.

3,777,691

MARINE ELEVATOR

William George Beale, 640 Barnham Rd., West Vancouver, B. C., Canada

Filed Apr. 10, 1972, Ser. No. 242,441
Claims priority, application Great Britain, June 25, 1971, 29,822/71
Int. Cl. B63c *1/02*
U.S. Cl. 114—48 6 Claims



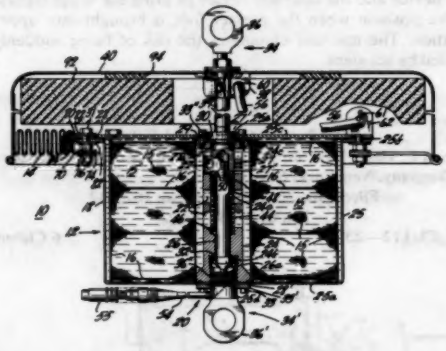
A marine elevator having a U-shaped, pontoon supported, frame into which a vessel to be lifted is moved and a winch operated cable supported platform mounted for vertical movement within the frame for lifting the vessel clear of the water. Vertical supports carried by the platform support the vessel, when lifted, in an upright position.

3,777,692

LATENT BUOYANCY SYSTEM

Russell C. Baccaglini, Oakland, and Kenneth J. Rogers, Boonton, both of N.J., assignors to Ocean Recovery Systems, Inc., Morristown, N.J.

Filed Nov. 5, 1971, Ser. No. 195,981
Int. Cl. B63c *7/02, 7/26*
U.S. Cl. 114—54 1 Claim



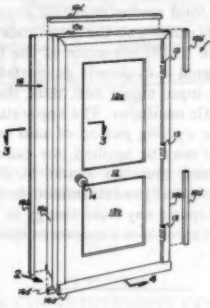
Submerged objects are recovered by a latent buoyancy system including LiH or another chemical reactive with water to evolve a gas and form an inert reaction product, an annular aluminum screen containing the chemical, and a closed, watertight, annular housing containing the screen and chemical. The chemical reaction is initiated by admitting water through one or more openings formed at a desired time on the inside of the annular housing. The gas inflates a cylindrical flotation bag and the reaction product is permitted to escape to provide maximum lift. The lower end of the bag hangs free and is not stressed by the payload; and it is well above the chemical, so that the gas collected by the bag first passes through water and is cleaned, scrubbed and cooled.

3,777,693

INTERIOR MARINE DOOR AND FRAME

Jack E. Leevers, San Diego, Calif., assignor to National Building Industries, National City, Calif.

Filed Aug. 18, 1971, Ser. No. 172,621
Int. Cl. B63b 19/00
U.S. Cl. 114—117 1 Claim



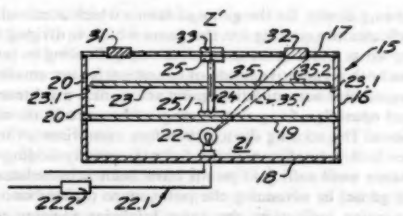
An interior marine door and frame in which the door is prehung in the frame by means of hinges on one side thereof and a lock on the other side, frame assembly comprising vertical jam members and an upper horizontal header member and a lower horizontal sill member. External stops cooperate with the frame assembly after it has been inserted into the opening in the ship's cabin walls to make the frame assembly captive within the wall.

3,777,694

AUTOMATIC DEVICE FOR TRIMMING VESSELS

Donald Edward Best, Delta, British Columbia, Canada, assignor to A. M. and I. Levellers Ltd., Vancouver, British Columbia, Canada

Continuation-in-part of Ser. No. 067,479, Aug. 27, 1970, abandoned. This application July 13, 1972, Ser. No. 271,232
Int. Cl. B63b 39/00
U.S. Cl. 114—126 13 Claims



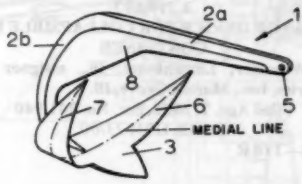
An automatic device for trimming vessels is disclosed having a sensing device responsive to continued departure from a desired attitude (e.g. list), trim tabs adapted to correct such departure, and electro-mechanical apparatus interconnecting the sensing device and trim tabs. The sensing device has an unbalanced pivoted disc with an opening. When the vessel lists the disc rotates with the opening becoming aligned between a photocell and a light source. The photocell output is then amplified and utilized to close a relay energizing an electric motor to opeate the trim tabs. The sensing device includes fore, aft, port and starboard photocells each associated with an amplifier and a relay circuit in the electro-mechanical interconnection apparatus.

3,777,695

ANCHORS

Peter Bruce, 10 Torphichen Pl., Edinburgh, Scotland

Filed Aug. 25, 1971, Ser. No. 174,633
Claims priority, application Great Britain, Aug. 26, 1970, 40,976/70
Int. Cl. B63b 21/32
U.S. Cl. 114—207 26 Claims



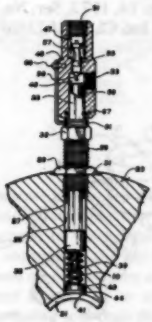
An anchor includes at least one elongate member attached to the shank and fluke of the anchor and having at least two elongate surfaces substantially curved lengthwise and disposed at least one at each side of the said plane of symmetry of the anchor, said elongate surfaces together being symmetrical about the said plane of symmetry and lying substantially in a plane transverse to said plane of symmetry relative to the shank member. In the anchor arrangement, said transverse plane is orientated such that when a portion of the elongate surfaces is in engagement with the mooring bed, the anchor is dragged over and relative thereto by a pull on the cable, the centre of pressure on the engaged portion of the elongate surfaces is constrained by the elongate surfaces to travel along the elongate member thereby increasing in separation from the cable attachment point on the foremost extremity of the shank member and decreasing in separation from the centre of area of those portions of the fluke member burial surfaces which furnish a maximum projected area on a plane at right angles to the plane of symmetry of the anchor whereby forces are generated between the elongate member and the mooring bed which roll the anchor to a final working burial attitude wherein the fluke member engages the mooring bed.

3,777,696

TEMPERATURE SENSING DEVICE

Robert A. Bilbrey, Orinda, Calif., assignor to Benjamin W. West, Berkeley, Calif.

Filed Mar. 29, 1972, Ser. No. 239,030
Int. Cl. G01k 1/02
U.S. Cl. 116—114.5 11 Claims



A temperature sensing device is described having a body defining a cylinder with a closed end and an open end. A rod extends through the open end and carries a piston which is movable with the rod in the cylinder. The piston is resiliently

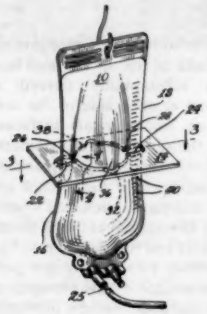
biased away from the closed end of the cylinder and is held near the closed end of the cylinder by a meltable metal or alloy solidified on the side of the piston toward the open end of the cylinder. When the metal or alloy melts in response to a rise in temperature, the piston moves toward the open end of the cylinder and the molten metal or alloy flows to the opposite side of the piston.

3,777,697

INDICATOR DEVICE FOR COLLAPSIBLE FLUID CONTAINER

Roger J. Woessner, Lindenhurst, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed Apr. 7, 1972, Ser. No. 241,940
Int. Cl. G01f *23/00*
U.S. Cl. 116—118 R **14 Claims**



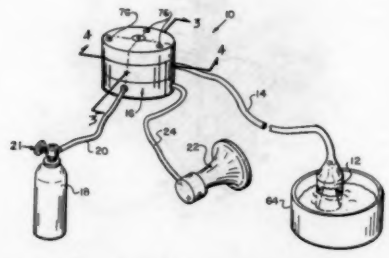
An indicator device is disclosed for measuring the volume of fluid present in a flexible container which collapses flat. The indicator device is a flat, generally stiff plate defining an aperture having an oval central portion, as well as a pair of auxiliary oval portions at opposite ends of the long axis of the oval central portion and communicating therewith. The indicator device slides downwardly along the collapsible container as the container empties, giving a uniformly reproducible indication of the amount of fluid remaining in the container.

3,777,698

CONDITION SENSING APPARATUS AND VALVE THEREFOR

Bryan J. Hunter, Boulder, Colo., assignor to E. F. Industries, Inc., Louisville, Colo.

Filed Jan. 14, 1972, Ser. No. 217,777
Int. Cl. G01f *23/00*
U.S. Cl. 116—118 R **21 Claims**



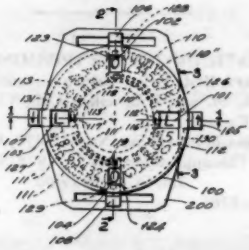
An apparatus for sensing and indicating the presence of a particular condition such as, for example, the level of a liquid within a container. Said apparatus includes a sensor means or a probe suitably positioned such as within the container. When the particular condition is sensed, such as a predetermined change of liquid level within the container, the sensor means or probe produces and/or transmits a suitable input signal such as a fluid input signal to a non-bleed amplification valve separated into a plurality of passages and chambers by a force responsive means arrangement such as a diaphragm arrangement. The force responsive means arrangement, passages and chambers in cooperation with one another and with a supply of fluid under pressure provide an amplified fluid output signal (relative to the magnitude of the fluid input signal) in response to the presence of the fluid input signal. The fluid input signal is cyclically generated upon continued application of the input signal and, thus, the apparatus functions as a pneumatic oscillator. The apparatus includes means for controlling the cycling period of said output signal. The fluid output signal may be applied, for example, to an audio alarm for indicating that the liquid in the container has reached the aforestated predetermined level. The valve assembly does not expend any fluid energy or require the input of any power when same is in a quiescent state.

3,777,699

TENNIS SCORING DEVICE

Frederick W. Pfleger, 1152 Barbara Dr., Cherry Hill, N.J.

Filed Dec. 13, 1971, Ser. No. 207,513
Int. Cl. A63b *71/06*
U.S. Cl. 116—120 **5 Claims**



A scoring device for the game of tennis which accumulates and indicates the scoring for the game which is divided into and known as point score and game score. Scoring in tennis requires both an additive mode of operation for accumulating point score and accumulating game score, and a subtractive mode of operation for point scoring under certain tie score conditions. The scoring device therefore comprises an input member and a totalize register for sequentially adding the point score until sufficient points have been accumulated to win the game. In advancing the point score register into the game winning indication, the game totalizing register automatically advances to the next indication. The point score register is capable of the additive and the subtractive movements by selective movement of the input member.

3,777,700

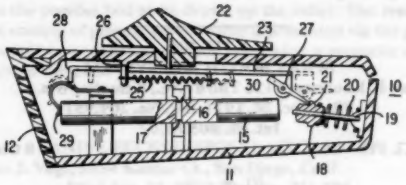
DAMPING MEANS FOR ULTRASONIC TRANSMITTERS

Angelo Gino Lazzery, Oaklyn, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 4, 1971, Ser. No. 186,167
Int. Cl. B06b *3/00*
U.S. Cl. 116—137 A **6 Claims**

There is disclosed an ultrasonic transmitter employing a rod

adapted to be mechanically vibrated in a longitudinal mode. The rod is struck at one end by a hammer assembly and is restrained at the opposite end to damp vibrations of the rod by a spring damper means mounted on the transmitter housing.

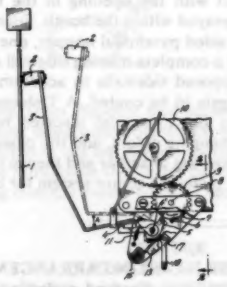


3,777,701

CLOCK CHIME INTENSITY CONTROL

Dale Nofziger, Lynnwood, Wash., assignor to Ansonia Clock Company, Inc., Lynnwood, Wash.

Filed May 5, 1972, Ser. No. 250,651
Int. Cl. G10k *1/36*
U.S. Cl. 116—149 **2 Claims**



The hammers for striking chime rods are supported for swinging by pivoted hammer stem supporting blocks. Pawls of rotary wheels engage heels projecting from such pivoted blocks to swing the hammers upward, and then release the hammers for falling to strike the chime rods. Falling of the hammers is arrested by toes of the supporting blocks engaging stop fingers. Rotary cams swing such stop fingers for engagement by the rotary block toes sooner to restrict the falling movement of the hammers for striking the chime rods lightly to sound softly, or to permit the hammers to fall farther for striking the chime rods firmly to sound loudly.

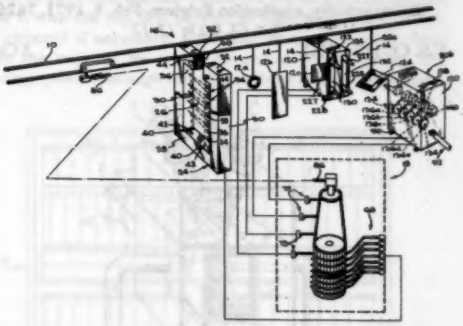
3,777,702

ELECTROSTATIC PAINTING SYSTEM

Carl E. Fitzgerald, Morton Grove, Ill., assignor to Indesco Corporation, Morton Grove, Ill.

Filed Oct. 12, 1970, Ser. No. 79,985
Int. Cl. B05c *11/00*
U.S. Cl. 118—2 **24 Claims**

An apparatus is provided for spray coating individual articles. The apparatus shown includes a conveyor for advancing the articles, a scanner for producing signals corresponding to the size and shape of the articles, a memory device for receiving signals from the scanner, and spray coating devices controlled by the memory device to provide a spray pattern for each article in accordance with its size and shape.

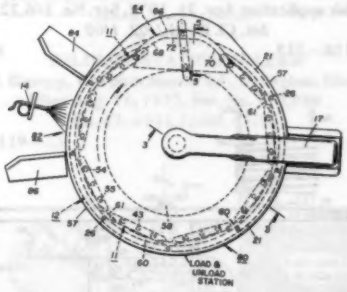


3,777,703

APPARATUS FOR SUPPORTING AND ROTATING A WORKPIECE

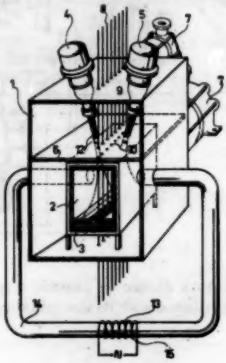
Robert E. Gillie, Chicago, Ill., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed June 2, 1972, Ser. No. 260,025
Int. Cl. C23c *13/08*
U.S. Cl. 118—49 **9 Claims**



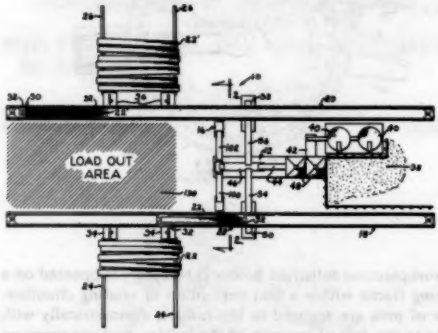
A workpiece or substrate holder is rotatably supported on a revolving frame within a film deposition or coating chamber. A pair of pins are secured to the holder, symmetrically with respect to the axis of rotation of the holder, and are received within a channel formed on one side by an arcuate guide ring, having a sector thereof formed in an arcuate trackway, the radius of the trackway being less than the radius of the guide ring. Rotation of the frame advances the pins along the guide ring, and the trackway is so configured that only the leading pin enters it. As the leading pin progresses through the trackway, the lagging pin is swung out of the channel, around the leading pin in the trackway, and back into the channel as the leading pin, to rotate the workpiece holder to allow for the deposition of a film on both sides of the workpiece.

3,777,704
APPARATUS FOR VAPORIZING METAL ON A SUBSTRATUM
L. Van Poucke, Kortrijk, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium
Filed Feb. 3, 1972, Ser. No. 223,215
Claims priority, application Belgium, Feb. 9, 1971, 762681
Int. Cl. C23c *13/12*
U.S. Cl. 118—49.1 3 Claims



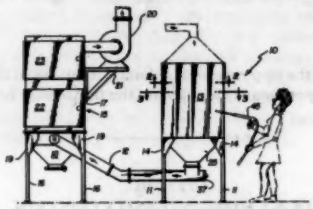
A device and method for vaporizing metal onto a substratum in which the metal to be deposited on the substratum is maintained in a crucible under vacuum, an elongated substratum is passed through the vaporized zone, and the metal is vaporized by a strongly focussed moving electron beam from an electron gun and deposited on the moving substratum.

3,777,705
APPARATUS FOR COATING PIPE
Robert J. Harris, Marrero, and Irvin J. Lee, Gretna, both of La., assignors to H.C. Price Co., Bartlesville, Okla.
Division of Ser. No. 104,428, Jan. 6, 1971, Pat. No. 3,674,546.
This application Apr. 21, 1972, Ser. No. 246,223
Int. Cl. B44d *1/02, 1/08*
U.S. Cl. 118—313 6 Claims



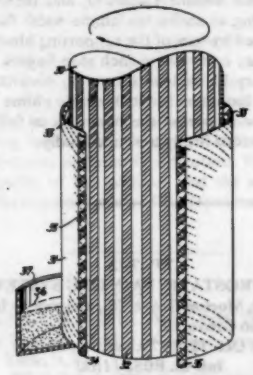
A method and apparatus for coating a pair of pipe sections utilizes spaced, parallel, track vehicles for moving the sections on opposite sides of a central coating station. Coating material is alternately supplied from the station to two applicators, which are located adjacent and perpendicular to the respective racks, by a reversible feeder belt. Movement of the sections is forward to the coating station and then backward away from the station. The pipe sections are spaced apart in their directions of travel so that their paths are 180° out of phase and one of the sections is at the forward end of its path of travel while the other is at the backward end of its path of travel. Thus, one section can be subjected to the coating step while the other section is being removed from the track vehicle.

3,777,706
SPRAY BOOTH AND SYSTEM
William F. Kaufman, 6126 Third Ave., Kenosha, Wis.
Filed Dec. 20, 1971, Ser. No. 209,951
Int. Cl. B05b *5/02*
U.S. Cl. 118—603 8 Claims



A spray booth having a double bottomed inverted pyramidal portion with the vertex thereof truncated to provide for the flow of air and collection of dust particles in which an air flow is provided interiorly of the double wall to thereby provide a curtain of air in front of the open portions of the spray booth and co-act with the opening in the bottom to remove fine particles sprayed within the booth. Four sidewalls extend above the four sided pyramidal hopper, one-fourth of which is open either as a complete missing sidewall of missing panels from usually opposed sidewalls to accommodate the passage of product targets to be coated. A T-shaped bottom connection appears on the pyramidal inverted hopper for quick cleaning when changing colors, and the passage of the air and particles to a filter bag chamber and thence to the suction blower which may include a return system for closed circuit operation.

3,777,707
MAGNETIC POWER HANDLING ARRANGEMENT
Robert James Hodges, Chestnut, England, assignor to International Standard Electric Corporation, New York, N.Y.
Filed May 26, 1971, Ser. No. 146,947
Claims priority, application Great Britain, June 23, 1970, 30,325/70
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 8 Claims



A powder transport and applicator arrangement comprising a vertically arranged roller surrounded by a three-fourth cylin-

drical shield having a vertically running gap, with the lower ends of both the roller and the shield dipping into a powder bed containing magnetic powder. The roller possesses axially arranged magnetic strips, and the shield on its inner surface helical ones. Rotation of the roller causes magnetic powder from the powder bed to be drawn up the roller. The resultant even coating of powder on the roller is presented via the gap in the shield to a recording surface to develop a magnetic image recorded thereon.

3,777,708

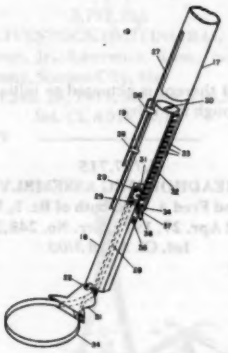
CANINE FECES DISPOSAL MECHANISM

Kuno J. Vogt, 5854 Kantor Ct., San Diego, Calif.

Filed Jan. 31, 1972, Ser. No. 221,996

Int. Cl. A47f *13/06*

U.S. Cl. 119—1 **4 Claims**



A canine feces disposal mechanism having a retractable flexible steel band which fits within a disposal bag having a folded pocket in the top portion thereof for receiving canine feces. The retractable steel band can be retracted closing the plastic bag over the canine feces for easy disposal.

3,777,709

REARING OF FISH

James Iain Walker Anderson, Milltimber; Donald Henry Albert Marr, by Fort William, and Graham Chesterton Phillips, Stonehaven, all of Scotland, assignors to Lever Brothers Company, New York, N.Y.

Filed Jan. 19, 1972, Ser. No. 219,158

Claims priority, application Great Britain, Jan. 28, 1971, 3363/71

Int. Cl. A01k *61/00*

U.S. Cl. 119—3 **9 Claims**

A method of rearing fish, particularly anadromous fish of the family Salmonidae in a captive environment. More particularly, rearing the young fish in fresh water and feeding them to appetite until they reach, and maintain for about two weeks, a Condition Factor, K, of at least 0.8; transferring the young fish directly from fresh water to natural tidal sea water, without acclimatisation in water of intermediate salinity; and, rearing the fish on an artificially administered diet for at least three months.

3,777,710

AUTOMATED SYSTEMS FOR RAISING AND TRANSPORTING BROILERS

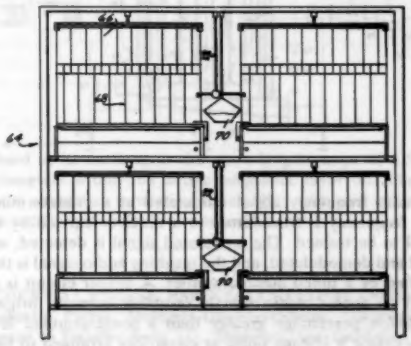
Vance Rhinehart, Apison, Tenn., assignor to Cumberland Corporation, Chattanooga, Tenn.

Filed Feb. 2, 1972, Ser. No. 222,805

Int. Cl. A01k *31/18*

U.S. Cl. 119—17 **21 Claims**

A coop and method for raising and transporting fowl wherein the fowl are raised in a coop with a first portion having an open top and a second portion closing that top while adding height to the coop and volume to the coop interior. For transportation, the second portions are removed to reduce the height of the coop to that suitable for transportation, but unsuitable for growing, and the first portions stacked so that the bottom of each first portion closes the top of the first portion below it with the top first portion in each stack being otherwise covered if necessary. Food and water can be provided within the cage or by access to conventional feeding and watering systems through the vertical bars of the first portion.



For exterior feeding systems the first portion preferably includes two telescoping members movable vertically with respect to each other and both having vertical bars with bars of one member disposed alternately with bars of the other member so that the members can be moved with respect to each other from a first position in which the adjacent bars have a first separation large enough for chicks to extend their heads between them for feeding and an inner volume sufficient for such young chicks to a second position in which adjacent bars in at least a portion of the coop have a greater separation large enough for fowl grown larger to extend their heads between them for feeding and an inner volume sufficient for such larger fowl.

3,777,711

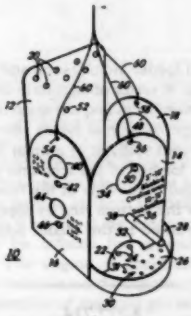
WILDLIFE STATION HOLDER

Robert J. Gampp, 120 Hutchinson Rd., Arlington, Mass.

Filed Aug. 11, 1972, Ser. No. 279,950

Int. Cl. A01k *31/00, 05/00*

U.S. Cl. 119—23 **9 Claims**

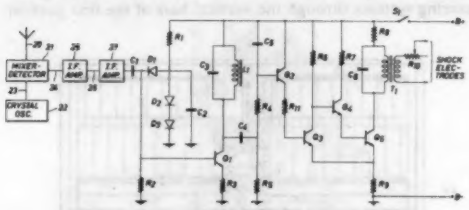


A wildlife station holder adapted for receiving a container insert including a rear wall, front wall, and two side walls joined together to form a four sided enclosure to receive a container, at least one of the walls having a feed hole in it or an access hole in it sized to accommodate the particular occupant and a bottom plate extending between the four walls to support a container insert.

3,777,712
ELECTRIC ANIMAL TRAINER

Hugh R. Gardner; Calvin I. Ricketts, both of Las Cruces, N. Mex., and Wesley L. Joosten, El Paso, Tex., assignors to Jetco Electronic Industries, Inc., El Paso, Tex.

Filed Feb. 1, 1972, Ser. No. 222,499
Int. Cl. A01k *15/00*
U.S. Cl. 119—29 **6 Claims**

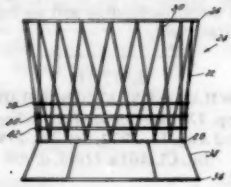


A radio frequency signal modulated at a predetermined audio frequency is transmitted to a receiver carried by the animal to be trained. The modulated signal is detected, amplified and demodulated, and the resulting audio signal is then amplified by a tuned audio amplifier. A trigger circuit is arranged to accept audio signals resulting from an original modulation percentage greater than a predetermined level and to create a voltage pulse at electrodes arranged to bear against the animal's fur. Means are provided for attenuating audio signals which differ from the predetermined audio frequency.

3,777,713
MOBILE HAY FEEDER

Richard A. Deats, Cobleskill, N.Y.

Filed Nov. 5, 1971, Ser. No. 196,144
Int. Cl. A01k *5/00*
U.S. Cl. 119—60 **5 Claims**



A portable animal feeder includes top and bottom vertically spaced annular rings. A series of angularly disposed posts connect the top and bottom rings and are spaced sufficiently apart to permit the passage of animal heads therethrough. Means are provided to prevent spillage of animal feed placed in the feeder. To facilitate loading of the feed into the device, an optional gate is provided in the side of the feeder. A supporting ring is spaced below the bottom ring by supporting struts, and floor means are mounted in the feeder adjacent the bottom ring.

3,777,714
ANIMAL WATERING DEVICE

Nils Harry Danielsson, Nykvarn, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

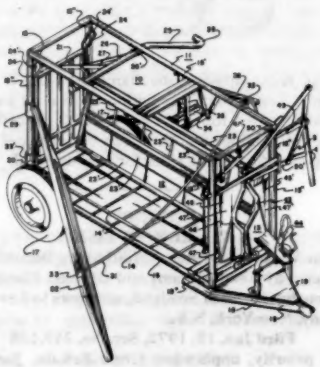
Filed Jan. 19, 1972, Ser. No. 218,935
Int. Cl. A01k *07/00*
U.S. Cl. 119—75 **3 Claims**

A bowl with an overflow outlet is positioned to receive and collect water from a valve connected to a water supply line. The valve is adjusted by stop means to drip the water into the bowl at a desired rate; but when an animal sucks the valve, a rotatable element thereof is actuated to initiate a continuous flow of water through the valve.

3,777,715
HEADHOLDING ASSEMBLY

Harold A. Hill, and Fred A. Hill, both of Rt. 1, Marsing, Idaho

Filed Apr. 27, 1972, Ser. No. 248,263
Int. Cl. A61d *3/00*
U.S. Cl. 119—99 **5 Claims**



The headholding assembly of this invention includes a collar and a halter carried by a framework. The collar includes a pair of pivotally mounted panels vertically disposed within a substantially rectangular frame. Each of the panels includes a curved recede portion on the interior, or adjacent abutting, terminal edges of each of the panels. The abutting edges of the respective panels are operable to closely conform to the configuration of an animal's neck. Each of the panels is pivotally mounted, at respective corners adjacent the recede abuttings at respective points located at the respective lowermost terminal side edges, to the frame. The panels are provided with lever-like means operable to force the panels apart at their respective upper portions opposite the pivot mounting. The halter includes a upstanding stanchion having a substantially inverted U-shaped configuration. The stanchion may be disposed distally on the framework forwardly from the collar. The halter includes a chin plate having a substantially convex configuration with respect to the stanchion. The chin plate may be suitably fastened to the uppermost terminal portion of the U-shaped stanchion. The halter includes a halter strap operable to engage the animal over its nose and head portions.

The strap is connected through holes provided in the chin plate and to a windlass which is carried by one of the upstanding legs or posts of the U-shaped stanchion. The headholding assembly may be disposed between the forwardmost transverse posts of a cattle chute. The headholding assembly may also be disposed within a chute comprising a chassis, an end gate disposed at the rearwardmost terminal end, an exit gate disposed at one of the terminal sides, and a body-restraining wall fastened to the frame and being operable to pivot at its lowermost terminal side to restrain an animal carried therein. In this form, the apparatus may include a cattle-restraining apparatus, the panels of the headholding assembly, above described, being disposed between upstanding posts at the forwardmost terminal end of the chassis frame. The halter is disposed distally forwardly from the panels with the legs of the upstanding stanchion suitably mounted on the chassis frame.

3,777,716

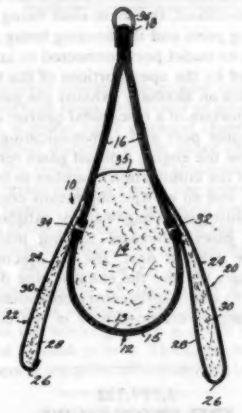
LIVESTOCK DUSTING BAG

William C. Cortner, Jr., Lawrence, Kans., assignor to Alley-Johnson Company, Kansas City, Mo.

Filed Jan. 28, 1971, Ser. No. 110,575

Int. Cl. A01k *29/00*

U.S. Cl. 119—159 **43 Claims**



A self-dusting cartridge loading protected livestock applicator comprising an inner porous bag having filling means and flexible protective material substantially surrounding and secured to the bag. The flexible protective material extends below the inner porous bag forming folds which curl upward toward the bottom of the inner porous bag and preferably extend upward with a porous material that contacts and transfers dust from the inner bag to itself and to an animal. The applicator is constructed so that when it is agitated by an animal the guard or protective flaps cause dust to be dispensed on the agitating animal and at the same time provide some protection to the more vulnerable inner bag.

3,777,717

METHOD OF AND APPARATUS FOR HEATING OF LIQUIDS

Jan Mach, and Vaclav Rybar, both of Praha, Czechoslovakia, assignors to Hutni druhovyroba, generalni reditelstvi, Praha, Czechoslovakia

Filed Mar. 30, 1972, Ser. No. 239,433

Claims priority, application Czechoslovakia, Apr. 12, 1971, 2377/71; Nov. 9, 1971, 7835/71

Int. Cl. F22b *13/02*

U.S. Cl. 122—156 **9 Claims**

A gaseaous combustible mixture, having a temperature lower than its ignition temperature, is passed with a speed exceeding its rate of flame propagation through a gas permeable layer of an radiation substance adapted to produce a thermal condition for radiating substantially the entire thermal energy,

released at its surface, in the wave-length range of 0.5 – 6 micrometers within the active substance layer on. The apparatus comprises a reaction space filled with said substance and a supply system for the combustible mixture.

3,777,718

THERMAL ENGINE, ESPECIALLY PISTON ENGINE

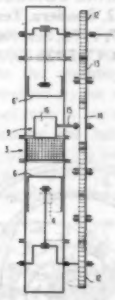
Konstantin Pattas, Stuttgart-Untertuerkheim, Germany, assignor to Daimler-Benz AG, Stuttgart-Unterturkheim, Germany

Continuation-in-part of Ser. No. 76,789, Sept. 30, 1970, abandoned. This application July 24, 1972, Ser. No. 274,513

Claims priority, application Germany, Sept. 30, 1969, P 19 49 191.9

Int. Cl. F02b *1/00, 23/00, 77/00;* **F03g** *7/06*

U.S. Cl. 123—8.01 **22 Claims**



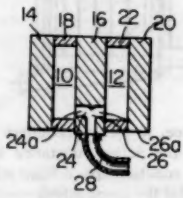
A thermal engine operating according to the Stirling process, particularly a piston engine which includes at least one hot gas section and one cold gas section between which a gaseous working medium is interchangeable by way of a regenerator. The working medium is heated directly in the hot gas section by the feed and combustion of fuel while the combusted working medium is at least partially replaced at the cold gas section by fresh working medium. An exhaust gas turbo-charger may be utilized for supercharging the fresh working medium. The engine is constructed so that fresh working medium is introduced during the transition from the expansion to compression of the cold gas section with a delay in the introduction of the fresh medium until late in the expansion phase. Either a rotary piston arrangement or an engine with axially reciprocating pistons may be used with both arrangements using piston controlled slot openings for admission of the fresh medium and exhaust of part of the medium. In the axially reciprocating piston arrangement, the piston of the hot gas section is axially aligned in a common housing with the piston of the cold gas section and with the regenerator arranged in the housing between said pistons.

3,777,719

EXHAUST SYSTEM FOR MULTI-ROTOR TYPE ROTARY INTERNAL COMBUSTION ENGINE

Kizuki Otsubo, and Yoshikazu Ishikawa, both of Tokyo, Japan, assignors to Nissan Motor Company Limited, Yokohama City, Japan

Filed Aug. 31, 1972, Ser. No. 285,349
Claims priority, application Japan, Sept. 1, 1971, 46/78926
Int. Cl. F02b *53/04*
U.S. Cl. 123—8.07 3 Claims



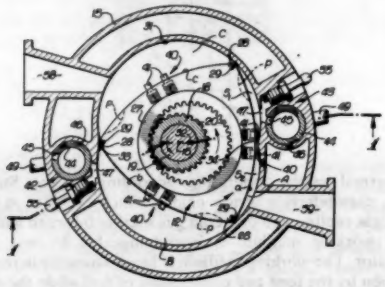
A rotary internal combustion engine of the multi-rotor type having a plurality of rotor chambers including exhaust chambers provided with exhaust ports respectively. The rotary internal combustion engine has an exhaust system constituted by exhaust passageways formed to be congregated in one portion of a rotor housing and communicating with the exhaust ports leading from the respective rotor exhaust chambers, and at least one exhaust manifold connected at one portion of the rotor housing to the exhaust passageways.

3,777,720

ROTARY INTERNAL COMBUSTION ENGINE

Robert H. Williams, Rt. 2, Bandera, Tex.

Filed Jan. 7, 1972, Ser. No. 216,153
Int. Cl. F02b *53/12*
U.S. Cl. 123—8.09 3 Claims



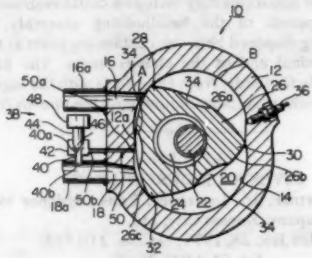
An outer hollow body provides a two lobed epitrochoidal cavity within which a three-lobed piston revolves to form a series of separate sealed working chambers, each of which progressively expands and contacts during each rotor revolution, the present engine dividing each chamber, as it approaches a condition of maximum contraction, into leading and trailing portions and delivering a pre-compressed fuel charge into said leading portion and igniting the same while said working chamber is still so divided, the power impulse thus produced being directed principally along lines lying in advance of the center of rotation of said rotor, and thus applying torque to said rotor.

3,777,721

ROTARY INTERNAL COMBUSTION ENGINE OF THE TROCHOIDAL TYPE

Hiraki Sawada, Nerima-ku, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Aug. 3, 1972, Ser. No. 277,533
Claims priority, application Japan, Aug. 19, 1971, 46/63261
Int. Cl. F02b *53/04*
U.S. Cl. 123—8.45 5 Claims



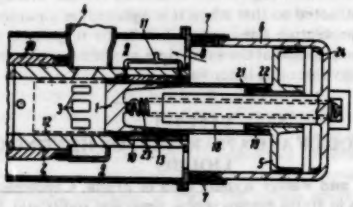
A rotary internal combustion engine of the trochoidal type having a trigonal rotor rotatable relative to the housing on an eccentric of a main shaft, the main shaft being supported by the lateral housing parts and the housing being provided with an inlet port and an outlet port connected to an exhaust pipe opened and closed by the apex portions of the trigonal rotor, and which includes an auxiliary exhaust gas passageway provided at the end portion of a trochoidal quarter of the housing adjacent the exhaust port and communicating with the exhaust pipe to cause the engine exhaust gases remaining in the trailing portion of the combustion chamber to be delivered to the exhaust pipe, and an air ejecting means cooperating with the auxiliary exhaust gas passageway for satisfactorily directing the exhaust gases otherwise leaking into the suction chamber into the exhaust port, the air ejecting means introducing secondary air into the exhaust pipe downstream of the exhaust port to effect satisfactory combustion of the still not unburned components contained in the engine exhaust gases.

3,777,722

FREE PISTON ENGINE

Karl Werner Lenger, Uhlandstrasse 66, Hamburg, Germany

Filed Sept. 1, 1970, Ser. No. 68,698
Claims priority, application Germany, Sept. 11, 1969, P 19 45 924.6
Int. Cl. F02b *71/00*; F02d *39/10*; F02f *1/20*
U.S. Cl. 123—46 R 23 Claims



A piston engine comprises a cylinder defining a combustion chamber, a ringless piston reciprocally mounted within the cylinder, the cylinder having means spaced from the combustion chamber and defining a zone of reduced clearance around the piston. This zone-defining means includes means for lubricating the zone to reduce friction. The lubricating means may comprise a gas-flow arrangement, or a bushing formed of self-lubricating material, or both of these features.

The cylinder and piston are fabricated from materials having a maximum coefficient of thermal expansion of 30×10^{-7}/° C. The engine may include a compressor piston reiprocal in a compressor cylinder which are designed for minimal heat expansion.

3,777,723

ROTARY INTERNAL COMBUSTION ENGINE

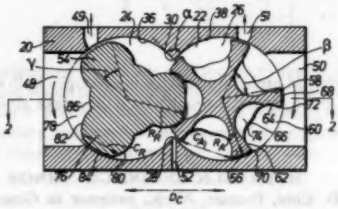
Jan-Borje Lundstrom, Lannersta; Ake Nyberg, Nacka; Roland Pamlin, Handen, and Ake Astberg, Nacka, all of Sweden, assignors to Svenska Rotor Maskiner Aktiebolag, Nacka, Sweden

Filed Mar. 14, 1972, Ser. No. 234,544

Claims priority, application Great Britain, Mar. 17, 1971, 7,079/71

Int. Cl. F02b *55/14*

U.S. Cl. 123—8.47 16 Claims



A rotary internal combustion engine comprising a casing providing a working space composed of intersecting cylindrical chambers, a power rotor disposed chamber, and a rotary abutment member disposed in the other chamber and intermeshing with the power rotor. The abutment member has five axial grooves inside its pitch circle. The grooves are at the bottoms thereof formed with part spherical cavities spaced from the axial ends of the member. The rotor has two or three lobes projecting outside its pitch circle and matching the grooves of the abutment. member. The tip chord of each lobe has a length corresponding to 35 percent to 40 percent of the distance between the centers of the cylindrical chambers. The axial length of the working space is about 90 percent of the opening chord of each groove. The angle between the cylindrical chambers in the point of intersection is about 74°.

3,777,724

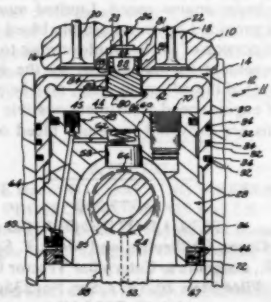
INTERNAL COMBUSTION ENGINE HAVING A VARIABLE VOLUME PRECOMBUSTION CHAMBER

Leo R. Kiley, Grosse Pointe Woods, Mich., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Nov. 3, 1971, Ser. No. 195,111

Int. Cl. F02b *75/04, 23/00*

U.S. Cl. 123—78 B 7 Claims



An internal combustion engine having a cylinder with a piston reciprocably movable to alternately compress and expand a main combustion chamber disposed above the piston, and a precombustion chamber communicating with the main combustion chamber. A volume control member carried by the piston projects into and varies the volume of the precombustion chamber to maintain a constant predetermined ratio between the volumes of the main and precombustion chambers during a portion of the reciprocal movement of the piston.

3,777,725

MEANS FOR VARYING THE AIR-FUEL RATIO IN A FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

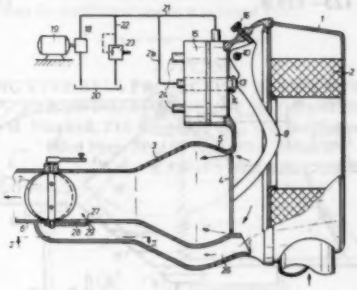
Gerhard Stumpp, Stuttgart-Vaihingen, and Gregor Schuster, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Apr. 23, 1971, Ser. No. 136,975

Claims priority, application Germany, Apr. 24, 1970, P 20 19 886.1

Int. Cl. F02m *69/00*

U.S. Cl. 123—119 R 14 Claims



In a fuel injection system the air-fuel ratio is controlled by a sensor which is disposed in the suction tube of the engine and which is responsive to the quantity of intake air flowing therethrough and controlled by an arbitrarily operable butterfly valve. The air-fuel ratio is alterable as a function of an engine variable by causing the latter to change the flow passage section of a bypass taking out one part of the intake air from the suction tube upstream of the sensor and reintroducing it into the suction tube downstream of the sensor.

3,777,726

FUEL INJECTION APPARATUS

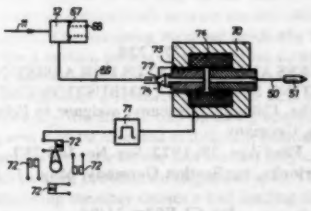
Heinrich Knapp, Leonberg-Silberberg, and Gunther Jaggle, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 28, 1971, Ser. No. 193,356

Claims priority, application Germany, Oct. 28, 1970, P 20 53 000.1

Int. Cl. F02m *39/00*; F02b *33/00*

U.S. Cl. 123—119 R 9 Claims



In a fuel injection apparatus which delivers metered fuel to fuel injection valves, there is provided, downstream of each

differential pressure valve which ensures a constant pressure drop across each fuel metering valve and upstream of the associated fuel injection valve, a chopper valve which, in the low rpm range effects an intermittent fuel injection into the intake tube of the internal combustion engine to prevent uncombusted gas mixture from entering the exhaust system in said rpm range.

3,777,727

FUEL FEED REGULATING DEVICE

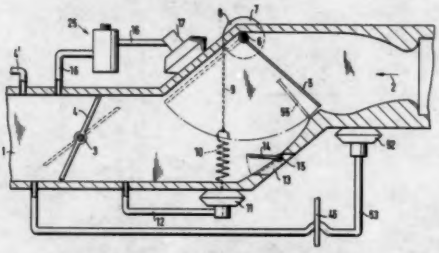
Willi Kirchner, Schwebheim, and Gerhard Braune, Euerbach, both of Germany, assignors to Kugelfischer Georg Schafer & Co., Schweinfurt, Germany

Filed July 25, 1972, Ser. No. 275,050

Claims priority, application Germany, Aug. 2, 1971, P 21 38 623.2

Int. Cl. F02m *9/06, 59/20, 63/02*

U.S. Cl. 123—119 R **11 Claims**



An apparatus for regulating the feed of fuel to a mixture-compressing internal combustion engine having a throttle valve and a normally closed sensor flap located within the air intake line. A channel connects the air intake line between the throttle valve and sensor flap to the atmosphere, this channel being opened and closed by a closure flap which is coupled to the sensor flap and a vacuum capsule responsive to the vacuum in the air intake line between the engine and the throttle valve. Regardless of the adjustment of the throttle valve upon the starting of the engine, the apparatus feeds only the necessary amount of fuel to the engine so that errors on the part of the driver during starting do not have an effect on the regulating device permitting the engine to start reliably.

3,777,728

PROCESS AND APPARATUS FOR ASSISTING IN STARTING INTERNAL COMBUSTION ENGINES

Alfons Reiche, Cologne, Germany, assignor to Peter Gessner, Bensberg, Germany

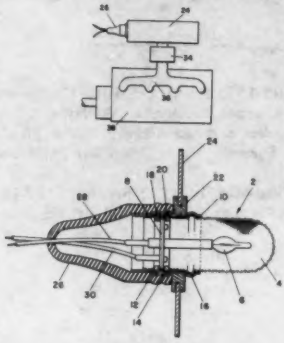
Filed Apr. 28, 1972, Ser. No. 248,757

Claims priority, application Germany, May 21, 1971, P 21 25 204.0

Int. Cl. F02m *31/04*

U.S. Cl. 123—122 D **6 Claims**

A process and equipment for facilitating the starting of internal combustion engines by heating the intake air of a fuel-air mixture before the air reaches the carburetor of the engine.



The preferred preheating device is a halogen bulb enclosed by a metal grid over and through which the intake air flows.

3,777,729

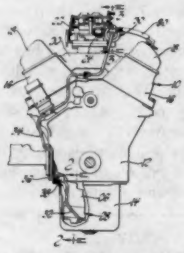
HYDRAULIC ENGINE GOVERNOR

James D. Cote, Pontiac, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 22, 1971, Ser. No. 210,790

Int. Cl. F02d *1/04, 1/06*

U.S. Cl. 123—140 FG **2 Claims**



In a preferred embodiment, an engine governor having a speed responsive spinner valve coupled with the engine oil pump in the engine crankcase and hydraulically connected with a slave actuator arranged to control the maximum opening of the engine throttle. An adjustable spring incorporated in the spinner valve provides a primary adjustment of the controlled maximum engine speed. Limited modification of the set speed is provided by an adjustable bleed valve located in the external portion of the hydraulic circuit to the slave unit at a point convenient for adjustment by the engine operator. Limited travel of the adjusting screw may be provided to limit the range of engine speed adjustment possible by the operator. Drain means are provided to return bleed oil to the engine sump.

3,777,730

FUEL LIMITING DEVICE

Marvin A. Gates, Chillicothe, and Mark F. Sommars, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

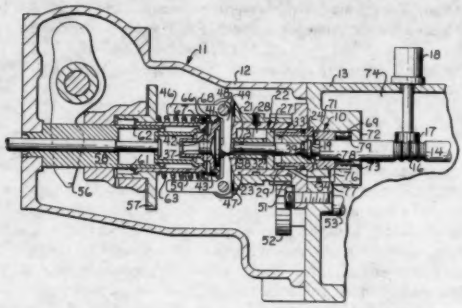
Filed Mar. 20, 1972, Ser. No. 236,382

Int. Cl. F02d *1/04*

U.S. Cl. 123—140 R **5 Claims**

A fuel limiting device for an internal combustion engine having a governor which governor is adapted to move a fuel-

adjusting member to an overfueling position during starting of the engine and to a normal fuel supply operating range after the engine has started. The limiting device is disposed in a non-interfering relation to the fuel-adjusting member during



engine starting and is movable in response to engine operation to a position which provides a positive stop for the fuel-adjusting member to preclude movement of the adjusting member to the overfueling position during lugging of the engine or other high-load conditions to minimize smoke emissions.

3,777,731

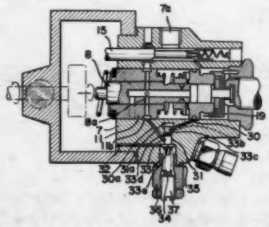
FUEL INJECTION SYSTEM IN A DISTRIBUTOR-TYPE INJECTION PUMP FOR INTERNAL COMBUSTION ENGINE

Masayoshi Kobayashi, and Mitsuo Uchino, both of Higashi, Japan, assignors to Diesel Kiki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 122,621, March 1, 1971. This application Feb. 14, 1973, Ser. No. 332,521

Int. Cl. F04b *49/00;* **F02d** *1/04, 1/06*

U.S. Cl. 123—140 FG **4 Claims**



Fuel injection system in a distributor-type fuel injection pump for internal combustion engine in which fuel in the distributing section of the injection pump is associated with engine rotation speed by throttling the flow of fuel to improve the fuel injection characteristic for the low-speed region to satisfy more effectively the injection requirements imposed by the engine.

3,777,732

DEVICE HAVING COACTING WHEELS FOR PROJECTING TENNIS BALLS

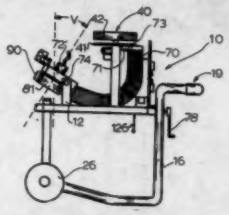
Donald P. Holloway; William H. Payne, and Donald H. Peeler, all of Raleigh, N.C., assignors to Metaltek, Inc., Raleigh, N.C.

Filed Mar. 20, 1972, Ser. No. 236,039

Int. Cl. F41b *3/04*

U.S. Cl. 124—1 **4 Claims**

A ball throwing machine ejects tennis balls in regular sequence and at a controlled velocity to simulate tennis service from an opponent during practice sessions. The machine is adapted to intermittently vary the vertical and horizontal angles of ball ejection thereby providing game-like situations. An anti ball jamming device is located in the base of a ball



hopper. The machine has structure for permitting rotation of the subframe about a vertical axis to vary the horizontal angle of discharge of a projectile. As an alternate method for varying the horizontal angle of discharge of a projectile the subframe may be oscillated about a vertical axis.

3,777,733

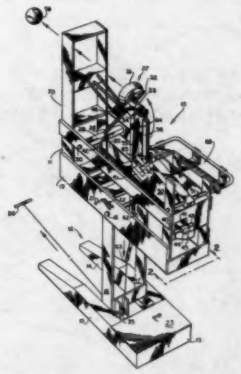
SPRING TYPE BALL PROJECTING DEVICE WITH BALL THROWING TIME DELAY MECHANISM

Joseph H. Mitchell, 216 Kingsway Dr., Warner Robins, Ga.

Filed Mar. 30, 1972, Ser. No. 239,637

Int. Cl. F41b *3/02*

U.S. Cl. 124—7 **14 Claims**



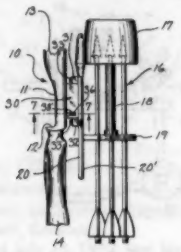
The apparatus has a ball throwing arm that is moved to a cocked position by means of a line that is pulled by a user. When the ball throwing arm reaches the cocked position it engages a retaining member that is connected to a dampening device. After release of the pull on the ball throwing arm by the user a spring immediately acts on the ball throwing arm to project a ball. The retaining member holds the ball throwing member for a certain period of time before complete release, due to the action of the delaying device. Also, when the line is released by the user a retracting member acts on the line to force it inwardly toward the ball throwing apparatus. The ball throwing arm may be oriented in different positions so that the ball impacting member on the end thereof may cause the projected ball to have preselected degree of spin. The cocking of the ball throwing member causes a ball feeding device to position a ball to be projected to be positioned in the path of the ball throwing member. The ball throwing device is selectively and pivotally adjustable to a support base.

3,777,734

ARCHERY BOW AND QUIVER

Harry J. Rose, 12247 W. Fairview Ave., Milwaukee, Wis.

Filed Jan. 10, 1972, Ser. No. 216,713
Int. Cl. F41b 5/00
U.S. Cl. 124—24 A 8 Claims



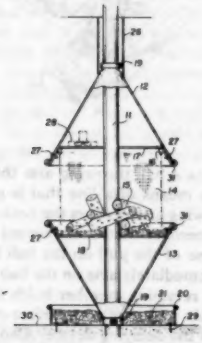
A bow is provided with a novel quiver-mounting element permanently secured on the side face of the rigid handle portion of the bow designed to removably receive an interfitting mounting element on an arrow-holding quiver, thereby providing a simple but effective assembly for securing the quiver on said bow handle in a manner whereby it will not interfere with the flexing or accuracy of the bow during shooting, and whereby said quiver can be quickly and easily manually removed from said bow when desired. The mounting elements telescope one within the other along an axis parallel to the longitudinal axis of the archery bow. The elements are releasably held together by a spring-loaded pivotal lever. The quiver has a mounting element for use in attaching the quiver to the belt of a user when the quiver is detached from the archery bow.

3,777,735

DECORATIVE FIREPLACE

Clifford J. Miller, North Massapequa, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 18, 1972, Ser. No. 245,125
Int. Cl. F24b 1/18
U.S. Cl. 126—120 2 Claims



A pre-fabricated fireplace adaptable for assembly about an existing vertical column, the device consisting of an inverted conical base, and a conical hood, both of which clamp about a vertical column, together with grate supporting structure and an internal shield for the hood. A circular curtain screen is hung from the hood over the base and the exhaust pipe may be mounted concentrically about the support post.

3,777,736

TRANSPORTER FOR SUBSTANTIALLY GERMFREE TRANSPORT OF BIG LIVING ORGANISMS

Dirk Van Der Waaij, Voorburg; Hendrik J. Erkelens, Delft; Pieter A. Bossers, Rotterdam, and Franciscus J. Kruiswijk, Delft, all of Netherlands, assignors to Nederlands Oranisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve Vande Volksgezondheid, The Hague, Netherlands

Filed Mar. 16, 1971, Ser. No. 124,767
Claims priority, application Netherlands, Mar. 16, 1970, 7003728
Int. Cl. B01d 46/12
U.S. Cl. 128—1 R 8 Claims

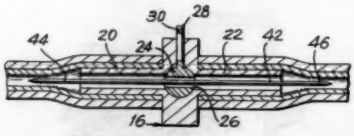
A transporter for substantially germfree transport of big living organisms from an operating-theatre to a clean room, which transporter contains a space wherein a laminar downflow of clean air is maintained by mounting an adjustable air-conditioning equipment provided with a power source of its own and with a connection to an other source of energy, the air-conveying channels surrounding the space on four of the five walls and an entrance to the space being provided with a mechanism for opening and closing that is coupled to the air-conditioning equipment.

3,777,737

METHOD AND DEVICE FOR REVERSIBLY INTERRUPTING FLUID FLOW IN A LIVING BEING

Louis Bucalo, Holbrook, N.Y., assignor to Investors In Venture, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 103,606, Jan. 4, 1971, Pat. No. 3,707,957. This application Mar. 13, 1972, Ser. No. 233,930
Int. Cl. A61b 19/00
U.S. Cl. 128—1 R 17 Claims



A method and device for reversibly interrupting flow of fluid along a passage in the body of a living being. The method and device are particularly adapted for use with the vas deferens of a human being. A member such as a vas deferens is at least partly cut transversely so as to have a pair of separated portions. Opposed ends of a valve are inserted into the interiors of these separated portions while a barrier is maintained between the separated portions to prevent them from communicating with each other. The valve is provided between elongated tubular portions of its housing which form the inlet and outlet of the valve with a barrier structure in the form of a ring to be situated between the separated portions of a member such as a vas, this ring having a diameter great enough to prevent communication between the interiors of the separated portions. When the valve is implanted it is provided with an elongated needle extending completely through and beyond the valve so that the ends of the needle can extend along the interiors of the separated portions of the vas, to prevent the separated portions from becoming closed during introduction of the valve. After the valve has been mounted in the vas the needle is removed. The valve is implanted in an open position and is closed only after the vas heals. This closing of the valve is brought about magnetically from the exterior of the body.

3,777,738

OPHTHALMIC DIAGNOSTIC INSTRUMENT

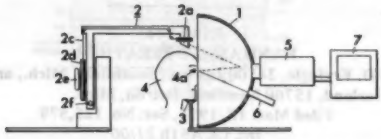
Kenichiro Sugita; Tetsuji Shimizu; Sinichi Ueno, all of Nagoya, and Tateki Muraoka, Kasugai, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Oaza-Shimoodai, Japan

Continuation-in-part of Ser. No. 834,041, June 17, 1969. This application Nov. 23, 1971, Ser. No. 201,467

Claims priority, application Japan, June 22, 1968, 43/52595; June 3, 1969, 44/51173

Int. Cl. A61b *3/10, 5/10*

U.S. Cl. 128—2 T 8 Claims



A device for examining pupillary reflex so constructed that a spotlight is applied directly or indirectly to an eye of a patient to cause pupillary reflex, an infrared lamp is provided to apply infrared rays to the eye for convenience of camera work, and an infrared camera and television set or screen are provided to catch and reproduce a motion of the pupil into an image. From the image of pupillary motion reproduced on the screen, an ophthalmologist can readily and exactly know the condition of retina, or optic nervous system, without any help of oral answer or sign of the patient.

3,777,739

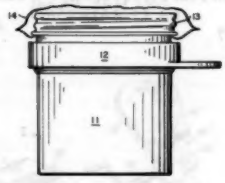
METHOD AND APPARATUS FOR COLLECTING URINE

Russell G. Raitto, Fitzwilliam, N.H., assignor to Concord Laboratories, Inc., Keene, N.H.

Filed Dec. 3, 1971, Ser. No. 204,496

Int. Cl. A61b *19/00*

U.S. Cl. 128—2 F 20 Claims



A device and method for collecting a liquid, such as urine, with little or no contamination thereof. The device when delivered for use includes a container member, an intermediate member secured to the container and a cap member encased in a closed bag and in turn secured to the intermediate member through the bag. During use the cap member is removed from the intermediate member and placed on a convenient surface, still in the closed bag. The intermediate member has a handle which then permits the user easily to hold the container in position for voiding urine into the container. The intermediate member is then removed from the container and discarded. The uncontaminated cap member is then removed from the closed bag and is threadably secured to the container so that the urine contained therein can be delivered for analysis in a substantially uncontaminated state.

3,777,740

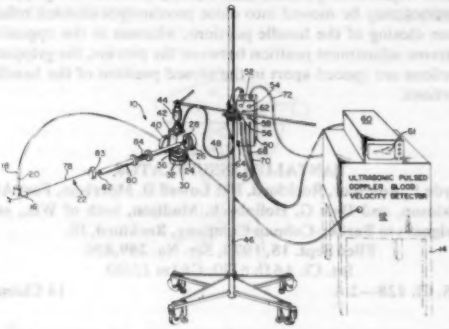
METHOD AND APPARATUS FOR NON-INVASIVELY VISUALIZING BLOOD VESSELS

David Eugene Hokanson, Mercer Island, Wash., assignor to The United States of America as represented by the Administrator for Veterans Affairs, Washington, D.C.

Filed Oct. 21, 1971, Ser. No. 191,399

Int. Cl. A61b *10/00*

U.S. Cl. 128—2 V 16 Claims



Apparatus for transcutaneously producing visual images of the internal dimensions of blood vessels in the human body is disclosed including an ultrasonic pulsed Doppler blood velocity detector having a transducer adapted to transmit a beam of ultrasound toward a blood vessel and detect ultrasound reflected from moving blood particles. The transducer is held by a mechanical arm capable of sensing the position and orientation of the transducer. The position and orientation of the transducer are combined with the distance of the blood vessel therefrom to locate the beam of an oscillographic storage display unit. A frequency detector is employed to intensify the beam of the storage display unit to write a spot on the display whenever the output of the pulsed Doppler is above a pre-set amplitude and frequency indicating blood flow within the blood vessel.

Method of use of the disclosed apparatus to produce visualizations of blood vessels in the human body are also disclosed.

3,777,741

DEVICE FOR LOCATING SORE SPOTS ON HORSE HOOVES

Bud A. Beaston, Rt. 1, Box 13, Sperry, Okla.

Filed Apr. 25, 1972, Ser. No. 247,378

Int. Cl. A61b *5/00*

U.S. Cl. 128—2 R 4 Claims

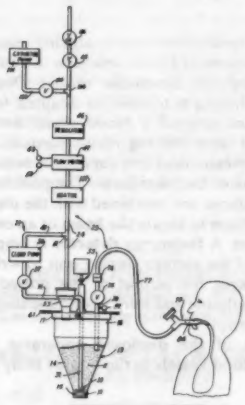
An adjustable pincer-like tool for engaging horse hooves for locating sore spots thereon. The tool comprises a first pincer

member provided with a handle portion and a gripping portion interconnected by an angularly disposed elongated slotted portion, and a second pincer member having a handle portion and a gripping portion interconnected by a relatively short angled portion, with the relatively short angled portion being pivotally secured to the elongated slotted portion in a manner permitting adjustment of the relative positions of the pincer members for providing an adjustable cooperating gripping position for the gripping portions of the pincers. In one extreme adjustment position between the pincers, the gripping portions may be moved into close proximity with each other upon closing of the handle portions, whereas in the opposite extreme adjustment position between the pincers, the gripping portions are spaced apart in the closed position of the handle portions.

3,777,742
TANTALUM INSUFFLATOR

Clyde F. Aumiller, Rockford, Ill.; Lowell D. Morrison, Fort Atkinson, and Dale G. Holinbeck, Madison, both of Wis., assignors to Barber-Colman Company, Rockford, Ill.

Filed Sept. 18, 1972, Ser. No. 289,836
Int. Cl. A61b *6/00*; **G61m** *13/00*
U.S. Cl. 128—2 A **14 Claims**



Apparatus for insufflating the airways of a patient with tantalum dust, either by the inhalation method or the catheter method.

3,777,743
ENDOMETRIAL SAMPLER

William J. Binard, and John F. Dye, both of Barrington, Ill., assignors to The Kendall Company, Boston, Mass.

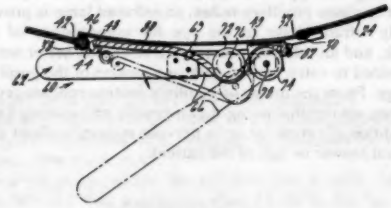
Filed Sept. 29, 1972, Ser. No. 293,676
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 B **8 Claims**

An endometrial sampler comprises a rigid hollow tube having a sampling end providing a plurality of sampling ports communicating with the interior of the tube, and sleeve means surrounding the tube and slidable with respect to it. The tube provides forward stop means and rearward stop means, and the sleeve means and tube are reciprocable with respect to one another between a sampling position in which the sleeve means exposes at least one sampling port, and a second position in which the sleeve means engages the forward stop means and covers the sampling ports. Cervical stop means engages the cervix and cooperates with the rearward stop means to limit travel of the sampling end to a predetermined distance beyond the cervix. A source of suction may be connected to the tube to draw sample material through the sampling ports.

3,777,744
HAND ASSIST BREATHER

James D. Fryfogle, 24500 Inkster, Southfield, Mich., and Carl C. Garland, 15700 Kentfield, Detroit, Mich.

Filed Mar. 18, 1971, Ser. No. 125,579
Int. Cl. A61h *31/00*
U.S. Cl. 128—28 **20 Claims**

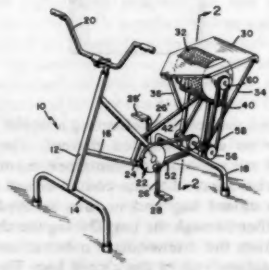


A medical appliance of a belt-like structure which is hand operable to improve and sustain respiration, and more specifically can be used by a patient for assisting exhalation of breath from the patient afflicted with obstructive lung disease which is operative by compressing the upper abdomen forcing the diaphragm against the distended lungs.

3,777,745
EXERCISE AND MASSAGING APPARATUS

Luther G. Simjian, 7 Laurel Ln., Greenwich, Conn.

Filed Feb. 14, 1972, Ser. No. 226,056
Int. Cl. A61h *15/00*
U.S. Cl. 128—57 **11 Claims**



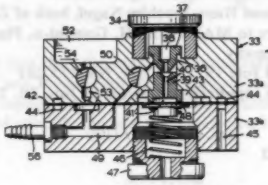
An exercise and massaging apparatus comprises a movable massaging element which is driven responsive to the expenditure of muscle power. The massaging element may form a part of the seat of the apparatus.

3,777,746

PULSATING DENTAL SYRINGE

Clyde Chi Kai Kwok, Montreal, Quebec, Canada, assignor to Edward V. Rippingille, Jr., Key Largo, Fla.

Division of Ser. No. 124,905, March 16, 1971, Pat. No. 3,698,416. This application July 10, 1972, Ser. No. 270,430
Int. Cl. A61h 9/00
U.S. Cl. 128—66 6 Claims



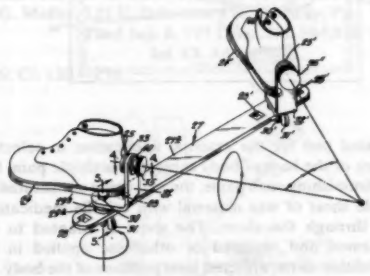
A pulsating dental syringe employing a fluid oscillator having a housing with a fluid inlet channel connected to a source of fluid under pressure, and first and second fluid outlet channels which communicate with the fluid inlet channel. A diaphragm is positioned so as to control the flow of fluid from the fluid inlet channel to the first fluid outlet channel. The second fluid outlet channel is connected to the fluid inlet channel upstream of the diaphragm, but the arrangement is such that the fluid flows through the first outlet channel when the diaphragm is in its open position. When the diaphragm is in its closed position, the fluid is diverted to the second outlet channel. The first outlet channel terminates in an end which is open to the atmosphere, and is dimensioned to produce an inertial effect in the fluid flowing through it. When the diaphragm moves to its closed position there is a momentary partial vacuum in the first outlet channel, which helps to hold the diaphragm firmly in its closed position. After the inertial effect has substantially dissipated, the force of the fluid against the diaphragm is sufficient to cause the diaphragm to return to its open position, whereupon the fluid resumes its flow through the first outlet channel.

3,777,747

UNIVERSAL SHOE SPLINT ASSEMBLY

Donald J. Friedman, 20 N. High St., West Chester, Pa.

Filed Feb. 2, 1972, Ser. No. 222,732
Int. Cl. A61f 3/00
U.S. Cl. 128—80 A 9 Claims



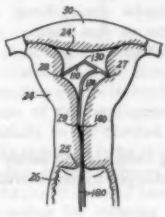
The present invention is an improvement in orthopedic devices of the type suitable for treating malformation of the lower extremities of infants and children. A multi-purpose splint or brace is provided which permits the orthopedic surgeon to make the widest possible range of corrective adjustments with or without controlled movement in pre-selected directions.

3,777,748

INTRAUTERINE CONTRACEPTIVE DEVICES AND INSERTERS THEREFOR

Harvey J. Abramson, New York, N.Y., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 836,371, June 25, 1969, abandoned. This application June 11, 1971, Ser. No. 152,231
Claims priority, application Philippines, June 15, 1970, 11535
Int. Cl. A61f 5/46
U.S. Cl. 128—130 23 Claims



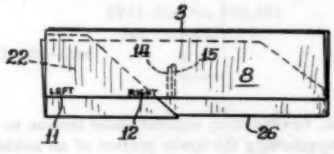
The present invention relates to intrauterine contraceptive devices in the general shape of a "7" having a transverse arm and a longitudinal arm dependent substantially from an end thereof; method of contraception by insertion of such a device into the uterus; instruments and methods for the insertion of intrauterine contraceptive devices into the uterus without employment of forces propelling said devices from the instruments in the direction of the uterine fundus.

3,777,749

FOLDED SURGICAL DRAPE

Robert F. Collins, Barrington, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Oct. 1, 1969, Ser. No. 862,830
Int. Cl. A61f 13/00
U.S. Cl. 128—132 D 9 Claims



A disposable surgical drape folded in a fashion to facilitate aseptic transfer of the drape from a folded position to a position covering the body area of the patient to be draped. A cuff is provided around an open end of the drape which receives both hands of the person applying the drape, and facilitates unfolding and applying the drape by allowing either hand to grasp the drape's toe portion while it is positioned under the cuff.

3,777,750

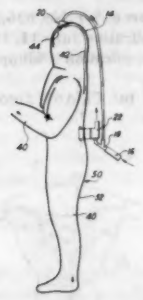
PROTECTIVE CLOTHING UNIT FOR CONDUCTING WORK IN A DELETERIOUS ATMOSPHERE

Jacques Savornin, Gif-sur-Yvette, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed July 21, 1971, Ser. No. 164,778
Int. Cl. A62b 7/00
U.S. Cl. 128—142.5 2 Claims

A protective clothing unit for work conducted in a tritiated atmosphere comprising a frogsuit made at least partly of sub-

stantially leak-tight flexible fabric, an ejector for removing vitiated air to the exterior of the frogsuit and a single air-supply pipe through which the flow is directed parly into the



frogsuit for supplying fresh air and partly to the ejector from which the flow is discharged to the exterior and carries with it the vitiated air.

3,777,751

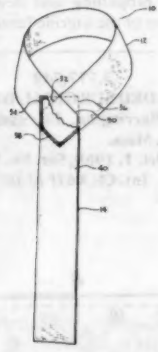
ANKLE SUPPORTS

Elmo E. Wise, 138 Hicks Rd., Castle Rock, Wash.

Filed Nov. 29, 1971, Ser. No. 202,898

Int. Cl. A61f *13/06*

U.S. Cl. 128—166 **10 Claims**



An inelastic, flexible strap secured under tension to an annular band surrounding the lower portion of an ankle of an athlete and bearing against the upper portions of the foot and heel bears snugly against the cuboid portion of the foot and limits inward roll of the foot to prevent outside sprain.

3,777,752

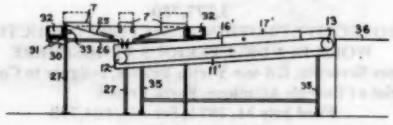
CHICK PROCESSING AND HANDLING DEVICE

Ray Goodwin, 124 N. King Charles Rd., Raleigh, N.C.

Filed Apr. 3, 1972, Ser. No. 240,593

Int. Cl. A61m *11/00*

U.S. Cl. 128—173 **6 Claims**



An improved apparatus for processing baby chicks so that they may receive necessary preliminary treatment before packaging in such manner as to reduce the amount of handling to improve the efficiency of operation and to minimize injury to the chicks. The apparatus comprises an annular conveyor and a belt conveyor connected by a chute means. As the chicks pass along conveyors, they are debeaked and vaccinated.

3,777,753

FEEDING BOTTLE TEATS

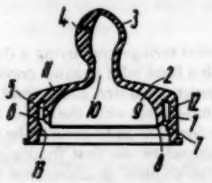
Lutz Kesselring, and Hans-Joachim Nagel, both of Zeven, Germany, assignors to MAPA GmbH, Gummi-u. Plastikwerke, Hannover, Germany

Filed July 19, 1972, Ser. No. 273,281

Claims priority, application Germany, July 20, 1971, G 71 27 808.5

Int. Cl. A61j *11/00*

U.S. Cl. 128—252 **10 Claims**



The disclosure relates to a teat, particularly for feeding bottles for babies, which teat has a nipple portion made particularly with a conically orthopaedic shape upon a base portion with an opening away from the nipple portion, which base portion can be fitted upon a bottle neck so as to grip around the latter with a cylindrical wall portion and also has inwardly directed projections.

3,777,754

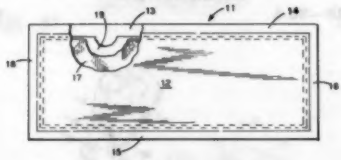
MEDICATED DISPOSABLE PAD

William Plachy, 84-20 51st Ave., Elmhurst, N.Y.

Filed Nov. 13, 1972, Ser. No. 305,735

Int. Cl. A61f *7/02*

U.S. Cl. 128—268 **5 Claims**



A medicated pad for the external application to selected joint portions of the human body subject to arthritic pain, for materially diminishing such pains; the pad being constituted of a thin pliable sheet of wax material with volatile medication distributed through the sheet. The sheet is adapted to be suitably warmed and wrapped or otherwise applied in its warmed condition to the afflicted joint portions of the body.

3,777,755

SUPPOSITORY

Harvey H. Groves, 6 Cherry Ln., Westport, Conn.

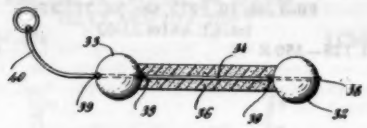
Filed Mar. 27, 1972, Ser. No. 238,305

Int. Cl. A61m *31/00*

U.S. Cl. 128—271 **20 Claims**

Disclosed is a suppository which includes two smooth-surfaced, body indissolvable bulbs approximately spherical or el-

lipsoidal in shape secured together by a body-indissolvable connecting member. The cross sectional area of the connecting member combined with any medication which may surround it is less than the combined cross sectional area of the bulbs and any medication which may surround them, so that when the suppository is inserted into the anal canal, the bulbs at each end straddle the anal sphincter muscles.

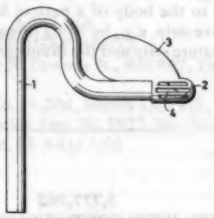


3,777,756

SALIVA EJECTOR

Torbjorn Lohr, Saltsjo-Bo, Sweden, assignor to Scania Dental AB, Hagersten, Sweden

Filed Feb. 17, 1972, Ser. No. 227,213
Int. Cl. A61m *1/00*
U.S. Cl. 128—276 **1 Claim**



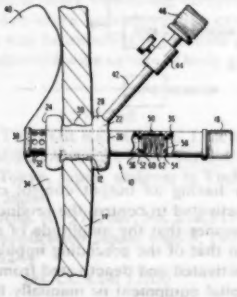
The present invention relates to a saliva ejector, preferably for non-recurring use having a suction pipe, one end of which co-operates with a source of power, the other end of which has a wing like member detachably arranged, said winglike member consists of a perforated body which is slipped onto said end of said suction pipe and rotatably arranged, and supporting the wing or forming an integrated part therewith.

3,777,757

SUCKING WOUND PLUG AND CHEST ASPIRATOR

R. Flanagan Gray, R.D. 1, Washington Crossing, Pa.; John Caswell, 125 S. Chancellor St., Newtown, Pa., and William G. Muller, 131 N. Delaware Ave., Yardley, Pa.

Filed Jan. 8, 1971, Ser. No. 104,960
Int. Cl. A61m *1/00*
U.S. Cl. 128—278 **13 Claims**



A unique inflatable bag catheter is provided having a pliable elongated bag disposed generally at the distal end thereof. A cylindrical end portion of the distal end may be formed with a plurality of apertures for the passage of fluids into the catheter from a space immediately adjacent the distal end. A terminal-most portion of the distal end of the catheter may be formed with a cushioning device to prevent damage to delicate internal portions of the body such as the lungs. A hand pump portion of the catheter may be threadedly and removably engaged with an inflatable balloon portion of the catheter. One-way valves may be provided in both the inflatable balloon portion of the catheter and the hand pump portion of the catheter to insure that fluids sucked in from the distal end of the catheter will travel only away from the distal end toward the proximal end of the catheter. One one-way valve may be disposed on either side of the hand pump which may comprise an elastomeric bulb. A conduit may be connected with the inflatable balloon for directing inflating fluids thereto. The free terminal end of the conduit may be fitted with threading corresponding with threading on the inflatable balloon portion of the catheter. Because of this arrangement, the hand pump may be attached initially to the conduit for inflating the balloon and then may be removed to be reconnected with the inflatable balloon portion of the catheter for evacuating fluids from within a body cavity. When the hand pump is threadedly engaged with the conduit for inflating the balloon, another one-way valve may be threadedly engaged within a free end portion of the elastomeric bulb portion of the catheter to convert the pump from a suction device to one for pressurizing of the inflatable balloon.

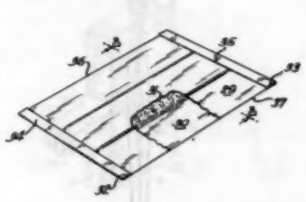
In one alternative embodiment, a valved face mask may be provided to require a user to forceably exhale so as to increase the compression force on internal drainage fluids which force, in turn, permits the expulsion of undesirable internal fluids through the catheter by the pumping action of the chest wall.

3,777,758

DISPOSABLE DIAPER

Frederick K. Mesek, 929 Clyde Dr., Downers Grove, Ill.; Robert C. Shepherd, 5084 Wick Dr., Oak Lawn, Ill.; William R. Strickel, 3647 W. 108th Pl., Chicago, Ill.; Gerald J. Liloia, 369 Alden Way, North Brunswick, N.J.; Louis F. May, Jr., 18 Garfield Ave., Old Bridge, N.J., and Norman Schiff, 24 Raleigh Rd., Kendall Park, N.J.

Continuation-in-part of Ser. No. 729,784, May 16, 1968, Pat. No. 3,663,348, which is a continuation-in-part of Ser. No. 515,874, Dec. 23, 1965, abandoned. This application Nov. 12, 1971, Ser. No. 198,381
Int. Cl. A61f *13/16*
U.S. Cl. 128—284 **16 Claims**



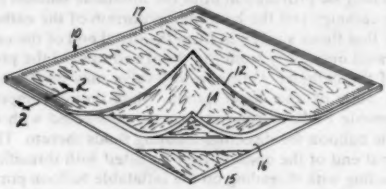
A disposable multi-layer diaper is disclosed in which a first layer to be brought into contact with an infant's skin, is a through bonded non-woven fabric of predominantly short length fibers mixed with long, i.e., textile length, fibers. The fabric is treated with a rewetting agent so as to have the desired degree of wettability and absorbency. A second layer, in juxtaposition to the facing layer, is a highly absorbent pad of short length fibers. The final layer, positioned on the side of said pad opposite said facing layer, is also through bonded non-woven fabric of predominantly short length fibers in admixture with long or textile length fibers. In each of the layers of the diaper the short length fibers are naturally occurring cellulosic fibers, e.g., wood pulp fibers and cotton linters having a length not exceeding about one-quarter inch.

3,777,759

ENZYME-DISPERSIBLE BANDAGE

Richard W. Oehmke, Hudson, Wis., and Ronald F. Ofstead, Maplewood, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 25, 1972, Ser. No. 291,659
Int. Cl. A41b 13/02
U.S. Cl. 128—287 6 Claims



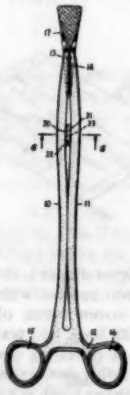
A readily disposable, multi-ply pad for contacting the body and absorbing body wastes consists of multiple plys of non-woven, fibrous material of good dry- and wet-strength, wet-strength being conferred on the materials by a binder which is essentially unaffected over periods of several hours or more by aqueous body wastes, but which is rapidly degraded by exposure to aqueous media containing enzymes; one or moreof the interior plys can be plain, untreated, non-woven fibrous material in the form of an absorbent pad; the whole pad being readily dispersed and disposable in domestic waste disposal systems by the addition of enzyme to the disposal receptacle together with the used pad, and such disposal having the advantage that even long-continued disposal of numerous pads has little or no deleterious effect upon domestic disposal systems.

3,777,760

SURGICAL STICK

Howard Essner, 5 Pine Brook Dr., White Plains, N.Y.

Filed Sept. 9, 1971, Ser. No. 179,021
Int. Cl. A61m 35/00; A61b 17/28, 17/08
U.S. Cl. 128—269 6 Claims



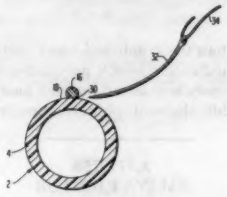
A surgical stick formed in one piece of a resilient material and having a pair of elongated clip members extending from the gripping portion and capable of being separated for the insertion of absorbent material therebetween and of being locked together for retaining securely the absorbent material.

3,777,761

POST OPERATIVE DRAINAGE TUBES WITH SUTURE STRIP AND METHOD OF USE

David S. Sheridan, Hook Rd., Argyle, N.Y.

Filed July 18, 1972, Ser. No. 272,871
Int. Cl. A61m 25/02
U.S. Cl. 128—350 R 6 Claims



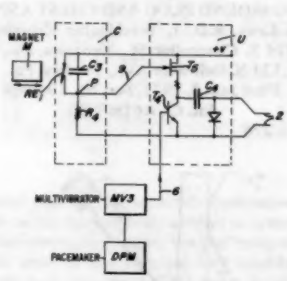
Post-operative drainage tubes, e.g., thoracic catheters, intercostal catheters and sump drain tubes, have a suture strip secured in piggy-back relation thereto. The drainage tube may then be fixed to the body of a patient by a suture which engages the suture strip, e.g., by being threaded through the joint between the suture strip and the drainage tube.

3,777,762

PACEMAKER WITH CONTINUOUSLY ADJUSTABLE OUTPUT AMPLITUDE

Lars Stig Nielsen, Copenhagen, Denmark, assignor to Christian Rovsing A/S, Copenhagen, Denmark

Continuation-in-part of Ser. No. 53,557, July 9, 1970, Pat. No. 3,669,120. This application Jan. 8, 1971, Ser. No. 104,952
Claims priority, application Denmark, Dec. 22, 1970, 6512
Int. Cl. A61n 1/36
U.S. Cl. 128—419 P 10 Claims



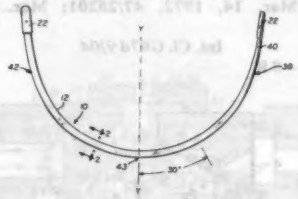
A pacemaker having an output control circuit which is adapted when activated to control the produced pace impulses in such a manner that the amplitude of each impulse is slightly less than that of the preceding impulse. The control circuit can be activated and deactivated from outside, either by suitable hospital equipment or manually by a surgeon. It permits the threshold value of the heart to be determined without surgical operation by ascertaining the smallest pace impulse that causes heart contraction.

3,777,763

ANGLED BREAST SUPPORTING FRAMES

Herbert L. Schwartz, Kew Garden Hills, N.Y., assignor to S. & S. Industries, Inc., Bronx, N.Y.

Filed May 15, 1972, Ser. No. 253,506
Int. Cl. A41c *1/14, 1/20*
U.S. Cl. 128—476 3 Claims



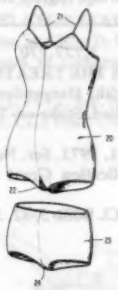
A breast supporting frame including an end portion twisted out of the normal plane thereof to an angular extent which progressively decreases from the terminal end of the frame to the inner end of said twisted portion which is located at a point spaced inwardly from the medial portion of the frame.

3,777,764

UNDERGARMENTS

Henry M. Herbener, 803 N. Dawson St., Box 977, Thomasville, Ga.

Continuation of Ser. No. 19,204, March 13, 1970, Pat. No. 3,712,308. This application Aug. 30, 1972, Ser. No. 284,719
Int. Cl. A41c *1/00*
U.S. Cl. 128—519 3 Claims



A garment formed at least in part of elastic material has an opening provided in the crotch thereof. A cover element in the form of a panty also formed at least in part of elastic material is worn over the main garment to cover the crotch opening and to restore body controlling compression lost in the main garment due to the provision of the crotch opening. The cover element may be attached to the main garment. The invention is applicable to a wide variety of body garments.

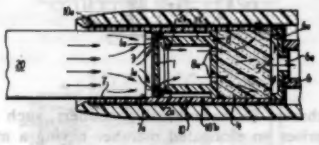
3,777,765

FILTER APPARATUS FOR REMOVING TAR AND OTHER DELETERIOUS SUBSTANCES FROM TOBACCO SMOKE

Sadao Yoshinaga, Tokyo, Japan, assignor to Yoshinaga Prince Co. Ltd., Tokyo, Japan

Filed Aug. 1, 1972, Ser. No. 276,917
Claims priority, application Japan, Aug. 5, 1971, 46/70007; Feb. 8, 1972, 47/16244
Int. Cl. A24f *13/06*
U.S. Cl. 131—187 7 Claims

Apparatus is disclosed for removing tars and other deleterious material from tobacco smoke including a cylindrical housing including an entrance chamber for receiving the tobacco product, such as a cigarette, and terminated at the inner end by a disk having a selected number of apertures therethrough for the passage of tobacco smoke. Further, channels are disposed within the disk to direct the flow of smoke from the end of the tobacco product into the apertures. An annular smoke guide is disposed on the rearward side of the aforementioned disk to present an edge onto which the smoke is directed by the disk apertures, whereby the tars and various deleterious products may be deposited. Further, the smoke is further drawn through a porous filter, whereby any remaining deleterious products may be absorbed. Such filter apparatus may be mounted within a holder including a mouthpiece hav-



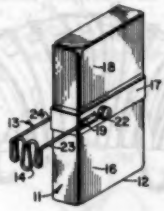
ing a passage therethrough in communication with the aforedescribed filter apparatus. In one illustrative embodiment, the mouthpiece is connected to a resilient bushing and is resiliently biased against an end of the filter apparatus to assure that air does not leak about the outer surface of the tobacco product and filter apparatus. In addition, the holder includes a cavity for mounting therein the filter apparatus and for facilitating the rectilinear movement of the mouthpiece to thereby enable the aforedescribed filter apparatus to be ejected therefrom. In one illustrative embodiment, the cigarette receiving opening of the cavity has therein a resilient holding projection for securing the filter apparatus within the cartridge, but permitting upon actuation of the mouthpiece member, the rejection therethrough of the filter apparatus.

3,777,766

PIPE TAMPING MEANS

Garland H. Kanady, 33 Hillcrest, Ponca City, Okla.

Filed Nov. 17, 1971, Ser. No. 199,536
Int. Cl. A24f *09/02*
U.S. Cl. 131—243 4 Claims



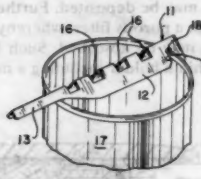
A tamper in combination with a lighter mechanism is provided wherein the tamper is attached to said lighter mechanism so that said tamper is adapted to slidably move through elongated hollow guide members between a first position wherein the tamping surface portion of the tamper is contiguous to the exterior portion of said lighter mechanism and a second position wherein said tamping surface is spaced away from said lighter mechanism. Further, the tamping surface of said tamper is an enlarged area formed so as to allow a major portion of the tobacco being tamped to constantly breathe during the tamping operation.

3,777,767

CIGARETTE HOLDER FOR ASH RECEPTACLES

William K. Wunsch, 2627 Clarkson St., Denver, Colo.

Filed Sept. 28, 1972, Ser. No. 293,130
Int. Cl. A24f *13/22*
U.S. Cl. 131—257 4 Claims



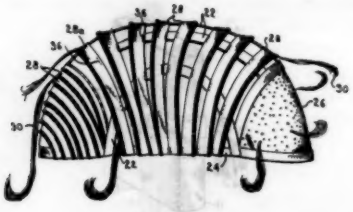
An attachment for cylindrical containers, such as coffee cans, comprises an elongated member having a main body portion and an extension of reduced cross section. The body portion has walls flaring downwardly from its top or ridge and attaching means near its end opposite the handle for frictional engagement with the top of the container; the handle is of reduced section extending from the ridge and arranged to rest on the top edges of containers of differing diameters within a predetermined range of diameters so that the body portion may be supported for use in a range of sizes of containers. Recesses for holding cigarettes horizontally across the container are arranged at spaced intervals along the ridge of the main body.

3,777,768

WEFTED HAIR STRUCTURE AND METHOD OF CONSTRUCTION

Josef Scigliano, Shawnee, Kans., assignor to Eva Gabor International, Ltd., North Kansas City, Mo.

Filed Aug. 21, 1972, Ser. No. 282,269
Int. Cl. A41g *3/00*
U.S. Cl. 132—53 19 Claims



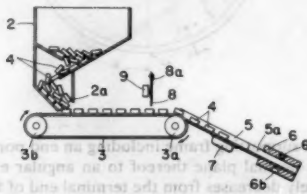
In a wig or other hair structure of wefted construction, each weft of hair is secured to one longitudinal edge of a flexible ribbon. The opposite longitudinal edge portion of the ribbon is attached to the base of the structure, the ribbon having sufficient width between the weft and the points of attachment to provide a flexible hinge support for the weft of hair to thereby permit free movement of the hair with the ribbon in directions transversely of the length of the ribbon. With ribbons disposed on the base in generally parallel relationship to one another, reversibility in the lay of the hair is provided. Besides the basic weft-ribbon configuration, double weft, stacked weft, loop and star configurations are disclosed, and special double ribbon embodiments for providing a line of hair concentration at a part.

3,777,769

COUNTING DEVICE HAVING MEMORY-READOUT AND LOGIC CIRCUITS

Shinichi Ueno, Inazawa, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishikasugai-gun, Aichi Pref., Japan

Filed Feb. 7, 1973, Ser. No. 330,417
Claims priority, application Japan, Feb. 12, 1972, 47/15066; Mar. 14, 1972, 47/25201; Mar. 14, 1972, 47/29912
Int. Cl. G07d *9/04*
U.S. Cl. 133—8 R 5 Claims



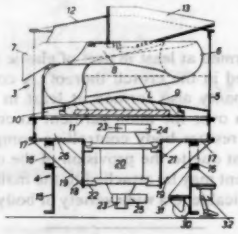
A device for counting articles capable of by far speeding up the counting time, which comprises a plurality of gates through which the articles are fed, a plurality of detecting means provided on the respective gates for generating a signal upon detection of the article, a plurality of memory-readout circuits connected to the respective detecting means and adapted to memorize the signals therefrom, a sweep signal generator for periodically reading out the signals memorized by said memory-readout circuit, a logical circuit and a digital counter or an analogic indicator for integratingly indicating signals obtained through said logical circuit.

3,777,770

APPARATUS FOR THE TREATMENT OF PARTS

David Cunningham-Smith, Harpenden, England, assignor to William Boulton Limited, Stoke-on-Trent, Staffordshire, England

Filed July 1, 1971, Ser. No. 158,747
Claims priority, application Great Britain, July 2, 1970, 32,121/70
Int. Cl. B08b *3/02*, *3/08*
U.S. Cl. 134—118 13 Claims



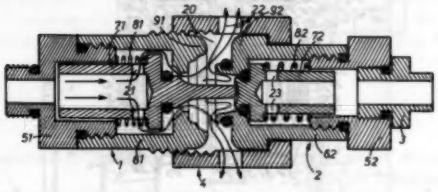
Apparatus for drying, cleaning or degreasing parts in which the parts are introduced into a body of drying, cleaning or degreasing medium in a chamber, the chamber being resiliently mounted and arranged to be subjected to a vibratory movement causing the charge of parts and a proportion of the medium to move outwards to the periphery of the chamber and from thence to climb up and around a spiral channel to a level above the body of medium, the parts and any medium carried up the spiral then being separated above the centre of the spiral so that the medium falls back into the chamber and the parts are discharged from the machine.

3,777,771

JOINING OF CONTAINERS

Patrick M. De Visscher, rue du Bois Imperial 16, Maransart, Belgium

Filed May 22, 1972, Ser. No. 255,465
Claims priority, application Belgium, May 27, 1971, 103,926; Apr. 28, 1972, 116,984
Int. Cl. F17d 1/00; F16l 35/00
U.S. Cl. 137—1 1 Claim



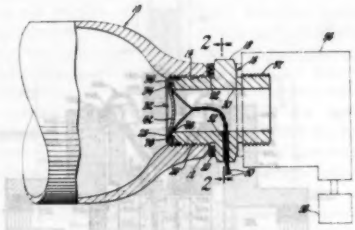
A process for joining together connecting parts of at least two containers which contain fluids at identical or different pressures, in an ambient fluid with a pressure that is lower than that of at least one of the containers, while preventing the ambient fluid to be introduced into one container, comprising the steps of first liberating the fluid of the container with a pressure higher than that of the ambient fluid, while effecting coupling of the connecting parts, and subsequently driving out the ambient fluid from the empty spaces between the connecting parts.

3,777,772

FLAP OPENING INFLATOR SEAL ARRANGEMENT

Thomas E. Arnold, Goleta, and Roy D. Plumer, Santa Barbara, both of Calif., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 11, 1972, Ser. No. 287,812
Int. Cl. F16k 17/40
U.S. Cl. 137—68 2 Claims



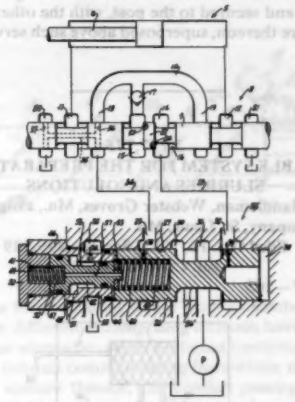
An inflator for a vehicle inflatable occupant restraint cushion includes an outlet having a generally cylindrical bore and a radial end wall, with the edge of the bore adjacent the end wall being chamfered to provide a radially angular juncture wall. A domed seal includes a flange seating on the end wall and secured thereto. The dome of the seal projects within the bore and closes the opening of the bore. The flange overlies the angular juncture wall and defines therewith a continuous circumferential recess of angular cross section. A discontinuous groove in the flange opens to the recess. A flexible shaped charge coterminous in extent with the groove fits within the recess. When the charge is fired, the dome separates from the flange along the groove and is swung relative to the flange by the flow of pressure fluid through the bore of the inflator.

3,777,773

PRESSURE COMPENSATING VALVE MECHANISM

William N. Tolbert, Pewaukee, Wis., assignor to Koehring Company, Milwaukee, Wis.

Filed Feb. 22, 1972, Ser. No. 228,020
Int. Cl. F15b 11/02
U.S. Cl. 137—117 13 Claims



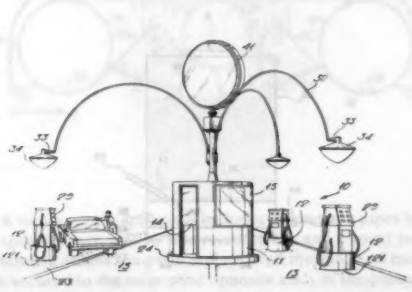
A mechanism which, in one form, is useful as an unloading valve, and in another form as a pressure compensating valve. It comprises a valve plunger having a bypass position allowing all source fluid entering an inlet port to flow to an outlet port, and having a feed position compelling flow of source fluid to a feeder port in an amount depending upon the extent the plunger is displaced from its bypass position. The plunger is held in a feed position under substantially strong force exerted thereon by a primary spring and by pressure fluid from the feedback port. When the feedback port is vented, the plunger moves to its bypass position under force exerted thereon by pressure fluid from the inlet port, against the force of the primary spring diminished by the force of a secondary plunger spring.

3,777,774

NOVEL GAS BAR STRUCTURE

Alfred Leonard Martin, 545 The West Mall, Etobicoke, Ontario, Canada

Filed Nov. 13, 1972, Ser. No. 305,678
Int. Cl. B67d 5/00
U.S. Cl. 137—234.6 15 Claims



A novel gas bar structure is provided. It includes a prefabricated kiosk, secured to a foundation securely anchored within the ground and extending slightly above the level of the ground. A post is provided which is anchored in the foundation centrally within the kiosk, and which extends upwardly through the roof of the kiosk. A sign is surmounted

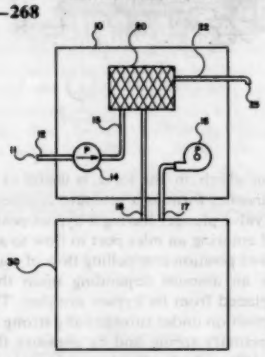
on the post and is preferably rotatable by a motor which is also mounted on the post. At least two planetary service islands are disposed equiradially from the center of the kiosk, the service island including a foundation securely anchored within the ground and extending a substantial distance above the ground, such service island including at least one gasoline dispensing pump thereon. An arched, cantilevered light fixture arm is provided for each such service island, each light fixture arm having one end secured to the post, with the other end having a light fixture thereon, superposed above such service island.

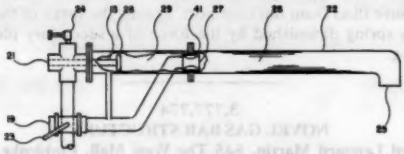
3,777,775

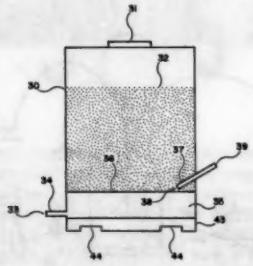
PORTABLE SYSTEM FOR THE PREPARATION OF SLURRIES AND SOLUTIONS

Avrom R. Handleman, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 10, 1972, Ser. No. 295,929
Int. Cl. A72c *37/06*
U.S. Cl. 137—268 **13 Claims**







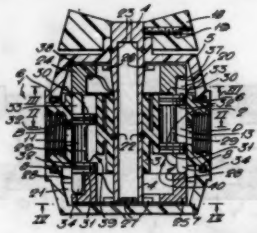
A portable system is described for preparing slurries and solutions which comprises an out-of-door storable bulk supply of particulate solid material in a container having a porous floor in combination with a mixing assembly which combination permits pneumatic fluidization and discharge of the particulate solid.

3,777,776

FLUID DISTRIBUTOR

Monique Boisserand, "Le Belvedere", 38-Voiron, France

Filed Mar. 31, 1972, Ser. No. 239,933
Claims priority, application France, Apr. 2, 1971, 7111740
Int. Cl. F16k *31/524*
U.S. Cl. 137—270 **5 Claims**



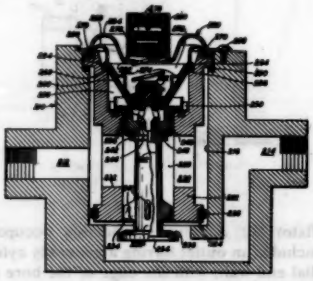
A fluid distributor valve including a solid disc-like body having a central hole surrounded by a plurality of cylindrical holes, and end covers on the body defining two chambers, one on each end; there is a sliding gate valve in each cylindrical hole, and a part or pipe from each hole to one chamber. The positions of the valves are determined by two cam plates, one in each chamber, rotation of which by means of a shaft passing through the central hole, causes the valves to move endwise in their holes and cover or uncover the parts.

3,777,777

FLOW CONTROL DEVICE

Jay R. Katchka, Cypress, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 21,868, March 23, 1970, abandoned, which is a continuation-in-part of Ser. No. 643,170, June 2, 1967, Pat. No. 3,550,623. This application July 31, 1972, Ser. No. 276,481
Int. Cl. F16k *31/365*
U.S. Cl. 137—454.6 **6 Claims**



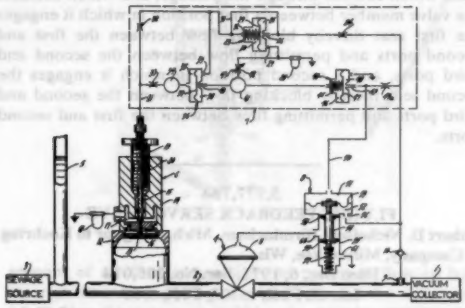
A fluid control device including a manual plug valve movable between a plurality of controlling positions and a pressure regulator assembly operatively disposed in the plug valve for independent movement to regulate the pressure of the fluid flow permitted by the plug valve. An outlet pressure sensing cavity in the regulator assembly is defined by a regulating diaphragm and a balancing diaphragm with loading of the regulating diaphragm being accomplished by resilient means or by pressure means.

3,777,778

TWO-POSITION LIQUID LEVEL CONTROLLER

George J. Janu, Milwaukee, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Aug. 30, 1972, Ser. No. 284,775
Int. Cl. F16k 31/36
U.S. Cl. 137—487.5 17 Claims



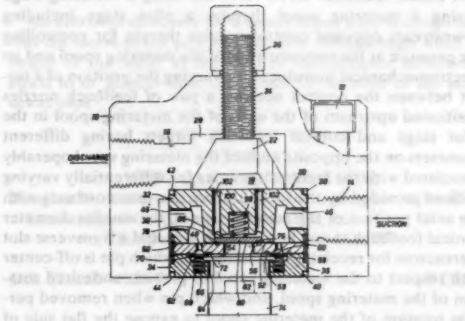
A two-position liquid level controller includes a static pressure sensor establishing a control signal at selected first level in a temporary storage means such as the standpipe of a vacuum operated sewage system. The sensor is connected upstream of a discharge control means and actuates a timer at the selected sensed pressure. The timer is connected to actuate the discharge control means and establish flow for a predetermined period in accordance with the setting of the timer to thereby establish a second pressure level. The timer may include an input delay to prevent actuation by momentary pressure conditions.

3,777,779

COMPRESSOR VALVE ASSEMBLY

Bernard L. Schwaller, 28 Hedwig Cir., Houston, Tex.

Filed July 28, 1971, Ser. No. 166,711
Int. Cl. F16k 15/02
U.S. Cl. 137—512.3 9 Claims



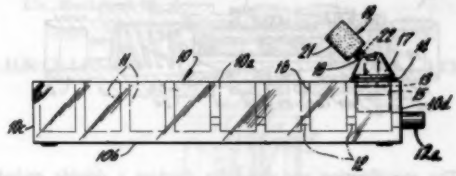
A compressor valve assembly according to the present invention may comprise a pair of body sections cooperating to define a suction valve recess and a discharge valve recess having suction and discharge valve elements disposed respectively therein and being operative to control the flow of fluid through suction and discharge passages also formed within the valve structure. The body sections are held in assembly by an assembly ring that closely encircles the body to maintain the same in proper alignment. Detent tabs formed on the assembly ring engage tapered friction support surfaces formed on each of the bodies to frictionally retain the bodies in properly centered assembly.

3,777,780

APPARATUS FOR EVACUATING FLUID FROM A CHAMBER

Thomas V. Czaplinski, North Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 24, 1971, Ser. No. 201,735
Int. Cl. G01n 33/00
U.S. Cl. 137—576 9 Claims



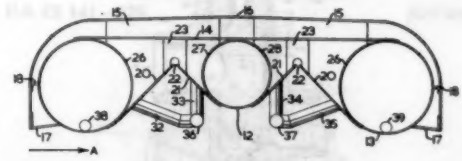
Apparatus for evacuating liquid from a chamber by means of a pressure differential comprising a chassis having a plurality of recesses adapted to receive a liquid containing chamber, at least one conduit communicating from within the chassis to an exterior surface thereof, the conduit passing through at least some of the recesses, the recesses being provided with receiving means adapted to receive a valve means, the valve means being provided with holding means for receiving a liquid holding chamber. Application of vacuum means to the external terminus of the conduit or of pressure to the liquid containing chamber causes liquid in the liquid containing chamber to pass through the valve into the recess and through the conduit. The apparatus may be used for diagnostic kits wherein a resin within the liquid containing chamber must be washed with water or wherein radioactive solutions in the liquid containing camber are loaded into generator columns.

3,777,781

STEAM SUPPLY APPARATUS

Norman F. Dove, 34-21st Ave., South, Cranbrook, British Columbia, Canada

Filed Oct. 25, 1972, Ser. No. 300,490
Claims priority, application Canada, Apr. 21, 1972, 140239
Int. Cl. F26b 21/12; D21f 5/18
U.S. Cl. 137—608 9 Claims



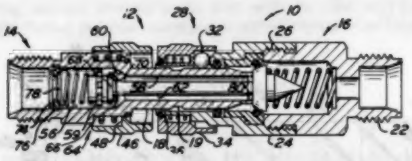
A steam supply apparatus includes at least two pipes located in spaced apart, side by side relationship, and a cover member extending across the pipes and secured thereto. End members are secured to the respective opposite ends of the pipes, and a pair of baffles between each pair of pipes are secured thereto in a substantially V-shaped configuration with a slot between adjacent ends of the baffles at the base of the V-shape, the base of the V-shape being directed towards the cover member. Steam is supplied to the pipes, and each pipe has a series of apertures communicating the interior of the pipe with the space between the pipes, the cover member and the baffles.

3,777,782

DOUBLE ENDED SHUT OFF COUPLING

Ashok S. Shendure, Warrensville Heights, Ohio, assignor to Crawford Fitting Company, Solon, Ohio

Filed June 15, 1972, Ser. No. 263,007
Int. Cl. F16l 37/28
U.S. Cl. 137—614.02 **7 Claims**



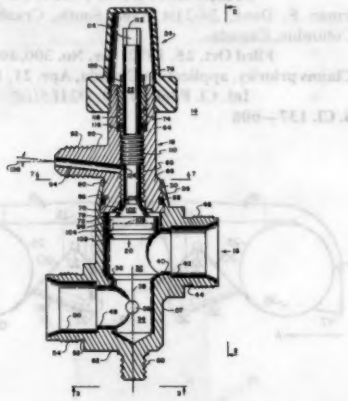
The specification and drawings disclose a double ended quick connect shut off coupling which includes a hollow-valved male stem which releasably connects to a hollow-valved female body by a ball-type detent arrangement. The male stem is provided with a valve having a portion which extends out of the stem. The hollow female body includes a plug-type valve member spring biased toward the end of the coupling and having a flat end face with a peripheral lip or flange. The end of the male stem is arranged so as to be received within the lip when the bodies are interconnected. The configuration of the plug is such that a substantially longer biasing spring can be used and valve flutter or chatter eliminated.

3,777,783

VALVE AND METHOD OF MAKING THE SAME

Maurice E. Beck, Fort Wayne, Ind., assignor to Kunkle Valve Co., Inc., Fort Wayne, Ind.

Filed Oct. 6, 1971, Ser. No. 187,031
Int. Cl. F16k 11/00
U.S. Cl. 137—625.5 **12 Claims**



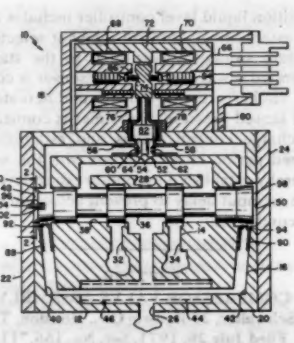
A double seat valve having a valve body formed of conductive metal with a relatively thin-wall top portion forming the side wall of an open ended cavity, and a bottom portion having a chamber therein communicating with the cavity. The bottom portion has first and second axially displaced ports communicating with the chamber, and a first valve seat in the chamber between the first and second ports. A valve top member has a portion extending into the cavity, that portion having a bottom enc closing the chamber, and an upwardly and inwardly tapered surface facing the wall. The wall is defomed into tight engagement with the tapered surface by forces created by a transient magnetic field of high intensity. The top member has an axial passage therethrough communicating with the chamber through the bottom end which has a second valve seat formed therein, and a third port communicating with the passage. A valve member is positioned between the first and second seats and is secured to a valve stem which extends through the passage, and which actuates the valve member between a first position in which it engages the first seat thereby blocking flow between the first and second ports and permitting flow between the second and third ports, and a second position in which it engages the second seat thereby blocking flow between the second and third ports and permitting flow between the first and second ports.

3,777,784

FLUIDIC FEEDBACK SERVO VALVE

Robert D. Nicholson, Birmingham, Mich., assignor to Koehring Company, Milwaukee, Wis.

Filed Dec. 6, 1971, Ser. No. 205,014
Int. Cl. F16k 11/07; F15b 5/00
U.S. Cl. 137—625.62 **7 Claims**



A fluidic feedback servo valve including a metering stage having a metering spool therein, a pilot stage including downstream opposed control nozzles therein for controlling the pressure at the opposite ends of the metering spool and an electromechanical transducer for varying the position of a target between the control nozzles, a pair of feedback nozzles positioned upstream of the ends of the metering spool in the pilot stage and conical feedback targets having different diameters on the opposite ends of the metering spool operably associated with the feedback nozzles for differentially varying orifices provided by the feedback nozzles in accordance with the axial position of the metering spool, the smaller diameter conical feedback target having a flat side and a transverse slot thereacross for receiving a locating pin, which pin is off-center with respect to the metering spool to prevent undesired rotation of the metering spool, and which pin when removed permits rotation of the metering spool to expose the flat side of the smaller diameter feedback target to the corresponding metering nozzle to permit withdrawal of the spool from the valve without disturbing the feedback nozzles.

3,777,785

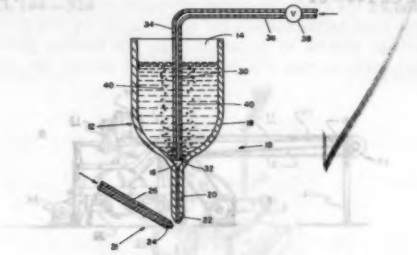
FLUID SWITCH

Alan Richardson Jones, Miami, Fla., assignor to Coulter Chemistry, Inc., Maunabo, P.R.

Filed Oct. 21, 1971, Ser. No. 191,215
Int. Cl. F15c 1/04
U.S. Cl. 137—806 **5 Claims**

The fluid switch controls the flow of a liquid from a funnel shaped receptacle and causes mixing of the liquid when the

switch is in a "closed" position. The switch includes an air nozzle which extends into the receptacle and opens at a point adjacent a bottom outlet opening of the receptacle. The nozzle is adapted to direct an air stream toward and through the outlet opening to pre-empt liquid flow therethrough. A greater



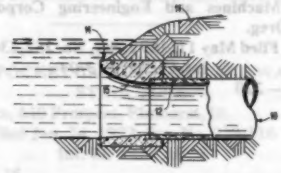
amount of air than is necessary to pre-empt flow of liquid through the outlet opening may be directed at the outlet opening so that the excess air bubbles through the liquid causing turbulence and mixing of the liquid prior to the "opening" of the switch.

3,777,786

ENTRANCE STRUCTURE FOR A LIQUID CONDUIT

Ira M. Gray, Route 2, Stamping Ground, Ky.

Filed July 24, 1972, Ser. No. 274,575
Int. Cl. F16l *9/00*
U.S. Cl. 138—109 **10 Claims**



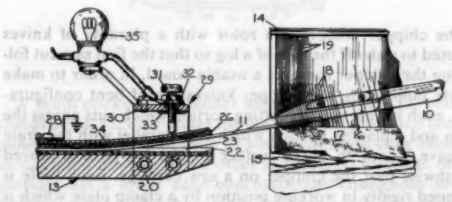
An entrance structure for a storm sewer pipe is designed so that the storm sewer pipe has full flow therethrough when the height of the water at the inlet of the entrance structure is equal to or greater than the height of the inlet of the storm sewer pipe.

3,777,787

WEFT CARRIER TAPE GUIDE

Douglas W. Anderson, Westboro, Mass., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed June 14, 1972, Ser. No. 262,797
Int. Cl. D03d *47/18*
U.S. Cl. 139—127 R **5 Claims**



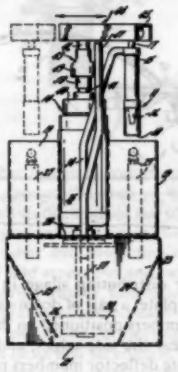
An improved guide for the flexible tapes of weft carriers in shuttleless looms which includes flexible guide members for decreasing the angle of upward deflection of the tapes as the carriers carried thereon are withdrawn from the warp shed and means operatively associated with the improved guide for indicating deflection of the tapes beyond a predetermined amount.

3,777,788

CYCLONE SEPARATOR

Mark R. Estabrook, Rockford, Ill., assignor to Barnes Drill Co., Rockford, Ill.

Filed July 21, 1971, Ser. No. 164,535
Int. Cl. B67d *5/02, 5/36;* **B65b** *3/26*
U.S. Cl. 141—279 **1 Claim**



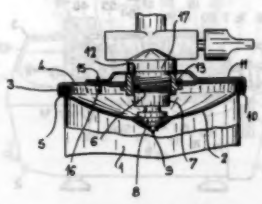
A cyclone separator is carried on the free end of a horizontal manifold which overhangs a pair of underflow collecting buckets and which is mounted to swivel about a vertical axis so that the cyclone can be positioned over either of the buckets to enable one bucket to be removed and emptied while the cyclone discharges into the other bucket.

3,777,789

DEVICE FOR CONNECTING A DISPENSING COUPLER TO A CONTAINER FOR FLUID UNDER PRESSURE

Gabriel Corlet, Pierre-Benite, France, assignor to Application Des Gaz, Paris, France

Filed Jan. 11, 1972, Ser. No. 217,028
Claims priority, application France, Jan. 18, 1971, 7102413
Int. Cl. B65b *3/04;* **B67c** *3/24*
U.S. Cl. 141—329 **10 Claims**



A device to connect a coupling for a dispensing device to a container of fluid under pressure, of the type comprising a plate which is formed at the edge with clips capable of being engaged from one side of the container around a rim surrounding the end wall, the plate having a tapped hole into which the coupling can be screwed, causing it to bear against the wall of the container to drive in a needle or rod capable of puncturing the wall or of opening the member of a holding valve which is provided thereon, so as to establish free communication between the coupling and the interior of the con-

tainer, wherein a movable element having at least one coacting clip capable of being engaged around the rolled rim is provided, the coupling when it is screwed into the plate, being arranged to cause the clip of the movable element to be locked in its engaged position around the rolled rim.

3,777,790

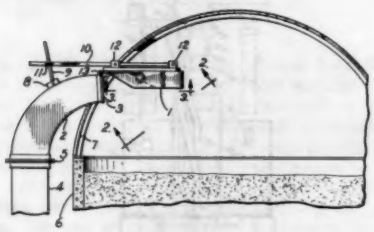
SILAGE GUIDE

Donald E. Rutten, Plainfield, and Richard A. Davis, Joliet, both of Ill., assignors to P & D Mfg. Co., Inc., Plainfield, Ill.

Filed Mar. 3, 1972, Ser. No. 231,575

Int. Cl. B65b *1/04*

U.S. Cl. 141—392 **13 Claims**



Silage guide for distributing silage in a storage container comprising a base plate, a pair of downwardly turned outer arcuate deflector members positioned on the bottom of the base plate preferably near the side edges, and a pair of outwardly turned inner arcuate deflector members positioned on the bottom of the base plate interior of the outer deflector members. Preferably a second pair of outwardly turned arcuate deflectors are positioned interior of the inner deflector members. The outer downwardly turned deflectors direct silage near the perimeter of the storage container and the inner outwardly turned deflectors direct silage across its cross section.

3,777,791

ELECTRIC PENCIL SHARPENER

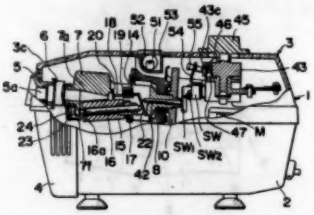
Hajime Uchida, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 22, 1972, Ser. No. 255,274

Claims priority, application Japan, May 26, 1971, 46/36525; Oct. 15, 1971, 46/81991; Nov. 8, 1971, 46/89345; Dec. 2, 1971, 46/97673; Feb. 28, 1972, 47/20890

Int. Cl. B43l *23/02*

U.S. Cl. 144—28.72 **18 Claims**



An electric pencil sharpener comprising a rotatable cutter holding block and a cutter element capable of undergoing a relative rotation with respect to the cutter holding block for shaving an end portion of a pencil inserted in the sharpener, the cutter element being adapted to separate away from its engagement with the end portion of the pencil, when the pencil end portion has been shaved to a predetermined degree of sharpness, so as to ensure the prevention of an excessive, unnecessary shaving of the pencil end portion beyond the predetermined degree of sharpness.

3,777,792

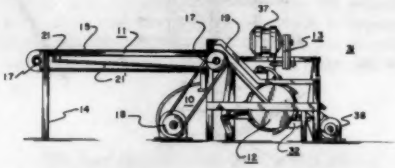
AUTOMATIC BED FRAME MACHINE

Paul Jameson, P.O. Box 465, Notus, Idaho

Filed Aug. 14, 1972, Ser. No. 280,687

Int. Cl. B27f *5/12*

U.S. Cl. 144—82 **4 Claims**



The bedframe machine includes a feed table, a rotary work fence, and a saw assembly. The rotary work fence and saw assembly are provided with a suitable drive subassembly to actuate the saw assembly and to actuate and position the rotary feed means.

3,777,793

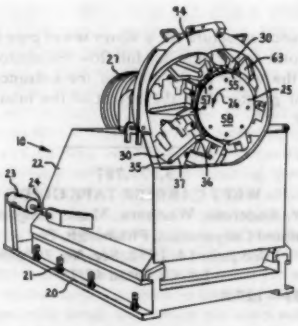
KNIFE HOLDER IN LOG SLABBING CHIPPER

Frederick L. B. Miller, Lake Oswego, Oreg., assignor to Chipper Machines and Engineering Corporation, Lake Oswego, Oreg.

Filed May 11, 1972, Ser. No. 252,230

Int. Cl. B27g *13/04*

U.S. Cl. 144—220 **9 Claims**



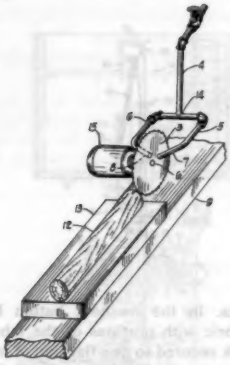
The chipper comprises a rotor with a plurality of knives adapted to slab off the side of a log so that the first saw cut following the chipper removes a usable board. In order to make usable pulp chips, the chipper knives are of bent configuration, each having a grain cutting portion which cuts across the grain and a planing portion which cuts parallel with the grain to leave a smooth board surface on the log as it is moved lengthwise past the chipper on a saw carriage. Each knife is clamped rigidly in working position by a clamp plate which is tightened on a pair of wedges adjacent the side edges of the knife. The clamp plate is crowned, causing it to flatten against substantially the whole area of the knife when the clamp plate is tightened on the wedges.

3,777,794

LIQUID COOLED SAW

Gordon D. McDonald, Surrey, B.C., Canada, assignor to SCM (Canada) Ltd., Scarborough, Ontario, Canada

Filed Nov. 4, 1971, Ser. No. 195,623
Int. Cl. B27b *1/00*; B27k *5/00*
U.S. Cl. 144—324 7 Claims



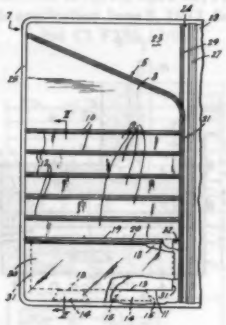
This invention relates to an improvement in a process for cutting a piece of wood with a cutting member directly cooled by liquid coolant. The improvement comprises using as a coolant, an aqueous dispersion of a wood treating agent selected from the group consisting of a wood preservative or colorant.

3,777,795

MULTI-POCKET CARD HOLDER AND WALLET STRUCTURE

Herbert Graetz, 440 Prospect, Elmhurst, Ill.

Filed Jan. 24, 1972, Ser. No. 220,116
Int. Cl. A45c *11/18*
U.S. Cl. 150—35 16 Claims



A multi-pocket card holder especially suitable for wallets comprises a backing panel having a plurality of card pocket panel sections thereon each of which has a top edge exposed in staggered relation to the other sections. At least one of the sections has a lower edge concealed and contiguous to the backing panel with one or more anchoring tabs each extending from the lower edge into a respective opening in the backing panel. One or more of the pocketed card holders may be incorporated in a wallet.

3,777,796

SCREW ROD WITH WASHER

Tetsuo Takano, Toyama, Japan, assignor to Takano Seimitsu Kogyo Co., Ltd., Nei-gun, Toyama-ken, Japan

Filed Nov. 18, 1971, Ser. No. 199,923
Claims priority, application Japan, Nov. 19, 1970, 45/102323; Nov. 19, 1970, 45/114967; Mar. 16, 1971, 46/17563; Sept. 27, 1971, 46/75315
Int. Cl. F16b *39/24*
U.S. Cl. 151—38 2 Claims

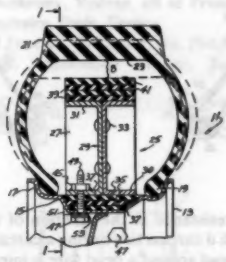
In a screw rod-washer assembly comprising a screw rod and a plain wahser fitted around the neck of said screw rod, the plain washer is secured to the neck of the screw rod by means of a plurality of projections formed at the inner peripheral edge of said plain washer and projecting close to the outer peripheral surface of said screw rod and, when said assembly further comprises a spring washer, said spring washer and said plain washer are integrally secured to each other by means of an upward annular projection projecting from the inner peripheral edge of the latter and received in the central hole of the former with the upper edge portion thereof bent radially outwardly in a manner to embrace the edge of the central hole of said spring washer, so that the screw rod-washer assemblies of the invention are adapted for mass production.

3,777,797

SAFETY SUPPORT FOR PNEUMATIC TIRES

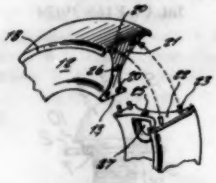
Hartley G. Anderson, 24130 Chipmunk Tr., Detroit, Mich.

Filed May 26, 1972, Ser. No. 257,393
Int. Cl. B60c *17/04*
U.S. Cl. 152—158 5 Claims



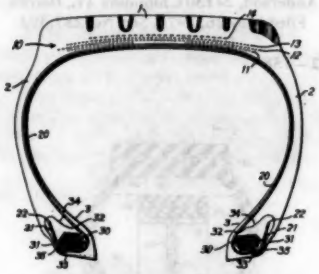
The safety support is adapted for positioning on the drop center type of wheel rim mounting a tubeless tire and consists of a resilient elastomer ring nested and secured within the rim drop center and yieldably mounting and securing a series of arcuate channel sections arranged end to end extending around said ring. An arcuate elastomer strip or a plurality of such strips is mounted upon the outer surface of each section and secured to each other with said strips normally spaced radially inward of the tire inner annular wall when it is inflated but adapted to supportably and yieldably engage said tire inner annular wall on deflation of the tire.

3,777,798
SAFETY WHEEL
Olan E. Marquis, South Star Rt., Box 63-A, Portales, N. Mex.
Filed Feb. 14, 1972, Ser. No. 225,711
Int. Cl. B60c 17/04
U.S. Cl. 152—158 4 Claims



An improved wheel for any automotive vehicle such as a passenger car, a truck or the like, the wheel including a radially outwardly projecting flange all around and which extends into the compressed air space surrounded by the tire, the outer end of the flange being approximately 2½ inches away from the inner peripherial edge of the tire so that in case of a blow-out of the tire, the drop of the vehicle body is limited to this dimension instead of dropping to the wheel rim, thus preventing a serious accident or possibly turning over of the vehicle.

3,777,799
PNEUMATIC TIRES
Jean Bernard Montagne, Cebazat, France, assignor to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie, Clermont-Ferrand, France
Filed June 1, 1972, Ser. No. 258,877
Claims priority, application France, June 8, 1971, 7120821
Int. Cl. B60c 15/06
U.S. Cl. 152—362 R 3 Claims



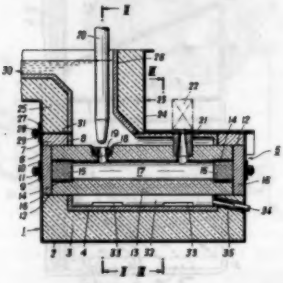
The damage resistance at the junction of the sidewall and the bead of a radial carcass tire having a carcass ply turned upwardly in each bead around a bead wire is improved by folding a stiffener around the end of the upturned portion of the carcass ply and bringing the ends of the stiffener into the vicinity of the bead wire.

3,777,800
ROMAN SHADE AND METHOD OF FABRICATION
Yasha A. Susoev, 151 Union St., San Anselmo, Calif.
Filed Dec. 30, 1971, Ser. No. 214,015
Int. Cl. A47b 5/00
U.S. Cl. 160—84 R 13 Claims

A Roman-type shade and method of fabrication. The fabric of the shade is formed into a series of horizontally extending, vertically spaced parallel folds which carry flexible battens adapted to rigidly hold the folds when the shade is hung and which permit cleaning of the shade without removal of the battens. In one embodiment the battens are secured within the folds by a line of stitching which extends through both the fabric and battens and with rearwardly extending marginal portions of the battens formed with openings and eyelets adapted to receive pull-cords arranged in a manner to raise and lower the shade. In another embodiment a line of stitching in the folds forms pockets for receiving the battens and with openings formed in certain battens for seating grommets which both receive the pull-cords and anchor the battens

within the pockets. In the method, batten locations are marked on the fabric with portions of the fabric along the length of each mark secured to one flat side of individual battens by adhesive means. In adjacent portion of the fabric is then folded over and secured in overlying relationship with the opposite side of the batten by adhesive means. Lines of stitching are then formed to extend through the fabric and into the battens. Openings are formed in the battens and adjacent fold portions with eyelets seated in the openings to receive the pull-cords.

3,777,801
CASTING APPARATUS
Oskar Tenner, Rossatz, Austria, assignor to Gravicast & Patentverwertungsgesellschaft m.b.H., Vienna, Austria
Filed Aug. 26, 1971, Ser. No. 175,098
Claims priority, application Austria, Aug. 28, 1970, A 7826/70; Sept. 4, 1970, A 8046/70
Int. Cl. B22d 37/00
U.S. Cl. 164—337 11 Claims



A casting apparatus is provided with a supply container for the melt which has a discharge opening leading the fluid melt into an equalization container arranged within said supply container in such a manner that the melt in the supply container surrounds the equalization container. The latter has a plug-controlled inlet which controls the flow of the melt into the equalization container. The equalization container has also an outlet having a casting nozzle therein which leads to a mold arranged outside of the supply container. The supply container is connected with a furnace in which the metal is produced.

3,777,802

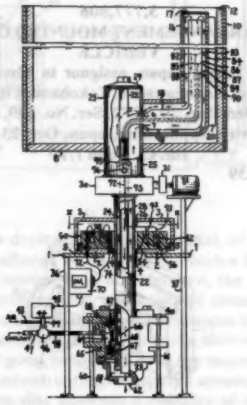
METHOD AND APPARATUS FOR TEMPERATURE CONTROL OF A ROTATING METAL OXIDE SCRAPER ELEMENT

Elgin E. Young, Norton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 856,744, Sept. 10, 1969, abandoned. This application May 27, 1971, Ser. No. 147,386

Int. Cl. F28f *17/10*

U.S. Cl. 165—1 11 Claims



Wall temperatures within a movable, internally cooled scraper element that is used to dislodge metal oxide accumulation from the internal wall of a reactor are monitored by a thermocouple electrically connected to mercury baths which are in turn electrically connected to a temperature recorder. The thermocouple output can be used to control a regulator of coolant fed to the scraper element.

3,777,803

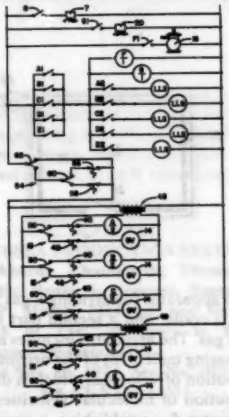
CONTROL FOR AIR CONDITIONING APPARATUS

Russell E. Wood, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 139,090, April 30, 1971, Pat. No. 3,709,769. This application June 5, 1972, Ser. No. 259,888

Int. Cl. F25b *13/00*

U.S. Cl. 165—2 2 Claims



A control arrangement for an air conditioning system adapted to serve a plurality of zones, a master control being provided in the control arrangement to energize and deenergize the zone thermostats, the master control energizing the individual zone thermostats in response to a preselected temperature variation from the zone thermostat set point in a respresentative zone, deenergization of the zone thermostats by the master control allowing the temperature in each of the zones to increase or decrease from the zone thermostat set point and reduce the load on the air conditioning system for weekend and nighttime operation.

3,777,804

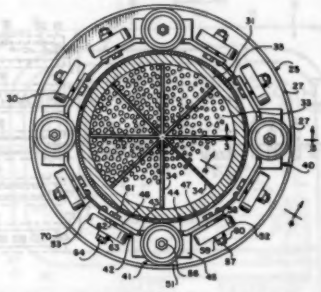
ROTARY FLUID TREATMENT APPARATUS

Lyle E. McCoy, 533 N. Whitehall Rd., Norristown, Pa.

Filed Mar. 23, 1972, Ser. No. 237,318

Int. Cl. F28f *19/04*

U.S. Cl. 165—8 3 Claims



A generally horizontal open carrier within generally upright fluid passage means, complementary outer and inner tracks respectively carried by the fluid passage means and carrier, and trolley means interposed between the tracks to mount the carrier for rotation in the passage means.

3,777,805

REFRACTORY MEMBERS FOR USE IN TERMINAL REGENERATORS OR RECUPERATORS

Joseph Racasens, Sorgues; Pierre Blanchet, Juvisy-sur-Orge, and Jacques Duchenoy, Vedene, all of France, assignors to L'Electro-Refractaire, Paris, France

Filed June 21, 1972, Ser. No. 264,954

Claims priority, application France, June 22, 1971, 7122638

Int. Cl. F23l *15/02*

U.S. Cl. 165—9.1 5 Claims

The invention relates to refractory members for use in the construction, by stacking of a number of such members, thermal regenerators or recuperators, such as those used in conjunction with glass or metallurgical furnaces, for recovering the heat contained in flue gases. The invention provides that the refractory member is formed of a monolithic structure cast

from fused refractory oxides. The member is in plan aspect shape composed predominantly of elongated portions, each having over the greater part of its length a maximum width which does not exceed 50 mm. The overall dimensions of the refractory member are sufficient to afford stability in stacking. The member may be star-shaped in plan aspect and it is advantageously formed by a number of parallelepipedal members joined together by casting into a monolith.

3,777,806

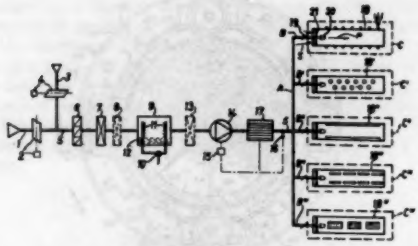
CLIMATIZATION PLANT

Pramodkumar Chhaganlal Tailor, Gandevi, India, assignor to Sprolair Engineering Systems AG, Zug, Switzerland

Continuation of Ser. No. 23,769, March 30, 1970, abandoned. This application Feb. 4, 1972, Ser. No. 223,493

Int. Cl. F24f 3/14

U.S. Cl. 165—19 **8 Claims**



A climatization plant, particularly for use in the textile and printing industry, for climating or air-conditioning working zones. The plant comprises a central device or station for preparing or conditioning a primary air stream, this station being connected to a plurality of distribution channels for prepared or conditioned air. Each distribution channel being provided at the inlet side with a device for conditioning the mixture of air composed of so-called primary air and secondary air, and having further means for controlling the volume or mass flow of secondary and/or primary air to thereby vary the heating or cooling power and the relative moisture content of the conditioned mixture of air.

3,777,807

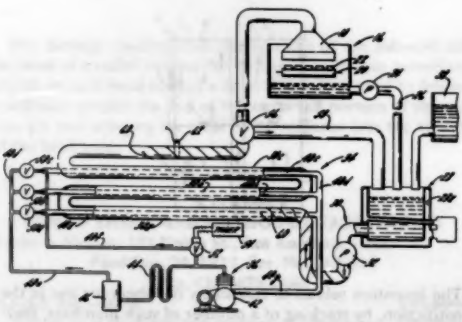
APPARATUS FOR TEMPERING CHOCOLATE

Lee Carroll, Philadelphia, Pa., assignor to W. C. Smith & Sons, Inc., Philadelphia, Pa.

Filed Sept. 10, 1971, Ser. No. 179,479

Int. Cl. F25b 29/00

U.S. Cl. 165—26 **10 Claims**



An apparatus is provided for tempering liquid chocolate to be used in the manufacture of confections or the like. Such tempered chocolate may, for example, be fed to a machine for applying chocolate coatings to candy pieces, bars and other articles, or it may be fed to a molding machine or to a hand worked production station. The chocolate becomes tempered to precisely the proper temperature, consistency and type and degree of crystallization by carefully and selectively treating it in a tube within a tube heat exchanger using alternate and controlled heating and cooling cycles.

3,777,808

COOLING ARRANGEMENT MOUNTED ON A MOTOR VEHICLE

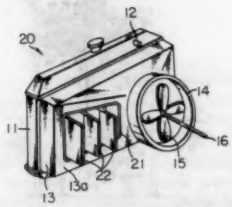
Masao Izumi, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Kanagawa-ku, Yokohama City, Japan

Filed Mar. 29, 1972, Ser. No. 239,138

Claims priority, application Japan, Oct. 23, 1971, 46/98347

Int. Cl. B60h 1/10

U.S. Cl. 165—39 **1 Claim**



A cooling arrangement for a motor vehicle which comprises a radiator connected to an engine of the motor vehicle, a shroud with a fan arrangement provided behind the radiator for drawing cooling air through the radiator. The shroud has provided at its back wall an aperture with a plurality of doors which shut or open the aperture to control the air flow in dependence on the engine temperature, atmospheric temperature, vehicle speed etc.

3,777,809

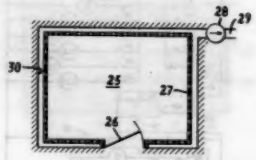
HEATING AND COOLING DEVICE AND METHOD

Karl F. Milde, Jr., 29 Kings Ct., Brooklyn, N.Y.

Continuation-in-part of Ser. No. 794,645, Jan. 28, 1969, abandoned. This application June 9, 1971, Ser. No. 151,298

Int. Cl. F24h 3/02

U.S. Cl. 165—54 **7 Claims**



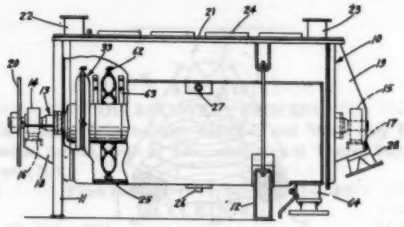
A method and apparatus for dividing a gas into two parts: a first part which is cooler and a second part which is warmer than the original gas. The apparatus includes a molecular filter for selectively passing molecules of the original gas that have a statistical distribution of velocities which is different than the statistical distribution of molecular velocities of the original gas, and a gas pump for establishing a pressure differential across the filter. The molecules which are passed through the filter will therefore exhibit a different temperature than the molecules which are not passed through.

3,777,810

DRYER

David L. Phillips, Fridley, Minn., assignor to The Strong-Scott Mfg. Co., Minneapolis, Minn.

Filed Aug. 24, 1972, Ser. No. 283,387
Int. Cl. F28f
U.S. Cl. 165—92 11 Claims



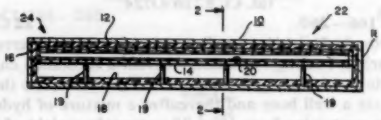
Apparatus for drying moist solid material, of the type utilizing disc heat exchange elements into which a heating fluid is introduced and cooled fluid is withdrawn, the material being dried through contact with a plurality of discs in its passage through the apparatus. The present apparatus is characterized by torus discs formed from relatively thin-walled circular metal plates for good heat transfer to the material and having a plurality of concentric rings of convex arcuate cross section for strength. The disc encloses a plurality of interconnected concentric generally toroidal chambers through which heating fluid, such as steam, is circulated successively and from the outermost of which cooled fluid, such as condensate, is withdrawn.

3,777,811

HEAT PIPE WITH DUAL WORKING FLUIDS

Arnold P. Shcosinger, Los Angeles, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed June 1, 1970, Ser. No. 42,088
Int. Cl. F28d *15/00*
U.S. Cl. 165—105 10 Claims



In a heat pipe containing a main working fluid that normally freezes under low heat loads, an auxiliary working fluid is provided that, although being less efficient than the main working fluid, nevertheless remains liquid at low heat loads when the main working fluid freezes, so as to sustain heat pipe action.

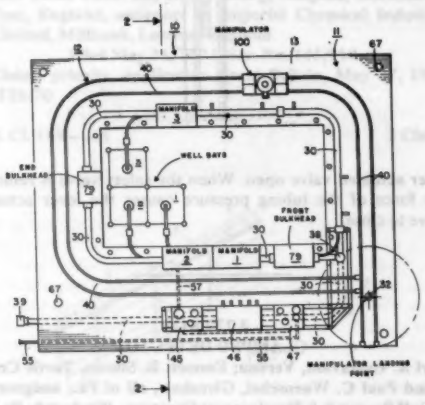
3,777,812

SUBSEA PRODUCTION SYSTEM

Joseph A. Burkhardt, Chatsworth; Thomas W. Childers, Woodland Hills; Roger J. Koerner, Santa Monica, all of Calif.; John P. Mason, Midland, and Danny R. Tidwell, Houston, both of Tex., assignors to Esso Production Research Company, Houston, Tex.

Filed Nov. 26, 1971, Ser. No. 202,230
Int. Cl. E21b *43/01*
U.S. Cl. 166—.6 11 Claims

A submergible template structure is completely equipped with manifolding for handling well production fluids, gas injection and well maintenance with through-the-flowline (TFL) pumpdown tools. The template is designed to contain a number of clustered wells and is provided with a pollution control system, electro-hydraulic power source and an unmanned manipulator unit capable of traveling on a track arranged on the template for specific maintenance work on valves, control pods, pipe sections, etc. The template is furnished power and control through an electrical cable laid to a remote surface power source. Pipelines connect the template manifolding to remote gathering terminals. The template structure and the manifolding are disconnectable and reconnectable in sections for removal, repair and replacement of damaged sections. The template structure is completely



equipped at the surface and then lowered to the sea floor using lines and controlled buoyancy. Once on bottom, the template is leveled and piles driven to anchor it. Wells are drilled from floating rigs and the wellheads are grouped together on the template. Christmas trees are lowered and connected to the wellheads and to the manifolding. Basic well maintenance is performed with TFL equipment although the wells may be reentered vertically from a floating rig when necessary. All valves are hydraulic fail-safe and manual valves in the manifold are operable by the manipulator unit. The manipulator is lowered to the track and positioned where desired when performing operation of the valves or basic maintenance on the valves and manifold.

3,777,813

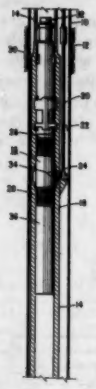
CHECK VALVE FOR HYDRAULIC CONTROL SYSTEM

Jackie D. Dendy; Robert D. Johnson, both of Lafayette, and Robert M. Peevey, New Orleans, all of La., assignors to Amoco Production Company, Tulsa, Okla.

Filed Apr. 24, 1972, Ser. No. 247,054
Int. Cl. E21b *33/03*, *43/12*
U.S. Cl. 166—72 4 Claims

This invention concerns a system using a hydraulic control line to control a downhole safety valve located in a string of tubing suspended in a well bore drilled in the earth. The hydraulic control line is in the space between the tubing string and the casing of the well bore. A special lever actuated valve means is used in the wall of the tubing string at the point where

the hydraulic line connects into the tubing string downhole. The insertion of a wireline retrievable safety valve holds the



lever actuated valve open. When the safety valve is removed the force of the tubing pressure causes the lever actuated valve to close.

3,777,814

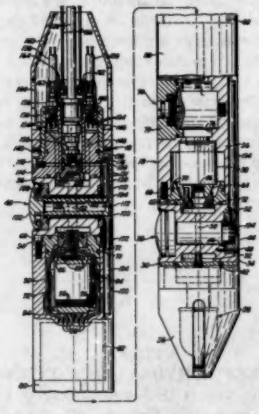
CLAMPED DETECTOR

Carl A. Gustavson, Verona; Emmett B. Shutes, Turtle Creek, and Paul C. Wuenschel, Glenshaw, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed May 19, 1972, Ser. No. 255,229

Int. Cl. E21b *23/00*

U.S. Cl. 166—212 **27 Claims**



A composite detector particularly useful in seismic exploration is disclosed, with means to clamp the detector in a borehole so that a vertical traverse can be made. The tool includes the features of a moveable clamping system, a dual hydraulic system to protect delicate components from the pressure of the borehole fluid, a fail-safe interposed between the final hydraulic system and the clamping pistons, and a jettisonable weight to facilitate downward motion of the tool into the borehole.

3,777,815

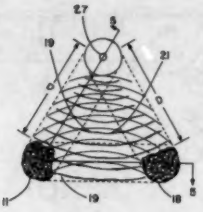
EXPLOSIVE FRACTURING METHOD

Charles R. Boardman, and Carroll F. Knutson, both of Las Vegas, Nev., assignors to CER Geonuclear Corp., Las Vegas, Nev.

Filed June 17, 1970, Ser. No. 46,950

Int. Cl. E21c *41/06*; E21d *43/26*

U.S. Cl. 166—247 **10 Claims**



A first explosive, preferably nuclear, is buried at a sufficient depth so that its subsequent detonation is fully contained within the earth. Thereafter a second explosive, also preferably nuclear, is buried a predetermined distance from the situs of the first explosive. After detonation of the first explosive, time is allowed to elapse during which the cavity formed by the first explosive collapses to form a rubblized chimney. Thereafter the second explosive is detonated to create a second chimney parallel to that of the first explosive together with a zone of enhanced permeability between the first and second.

3,777,816

METHOD FOR THE IGNITION OF IN-SITU COMBUSTION FOR THE RECOVERY OF PETROLEUM

Albert Meier, Reinbek, Germany, assignor to Deutsche Texaco Aktiengesellschaft, Hamburg, Mittelweg, Germany

Filed Apr. 15, 1971, Ser. No. 134,463

Claims priority, application Germany, Apr. 17, 1970, P 20 18 372.6

Int. Cl. E21b *43/24*

U.S. Cl. 166—260 **22 Claims**

A method of initiating in situ combustion in a subterranean hydrocarbon-bearing formation wherein a substance capable of reacting with hydrogen peroxide is introduced into the formation via a well bore and thereafter a mixture of hydrogen peroxide containing from 10 to 20 percent by weight of water is injected to effect an exothermic reaction thereby to increase the temperature of the formation adjacent the well bore to the ignition temperature of the hydrocarbons contained therein and resulting in ignition of those hydrocarbons and the initiation of an in situ combustion.

3,777,817

OIL RECOVERY PROCESS

David George Feuerbacher, Bellaire, and Mary Kay Hrncir Smith, Austin, both of Tex., assignors to Texaco, Inc., New York, N.Y.

Filed Dec. 30, 1971, Ser. No. 214,443

Int. Cl. E21b *43/22*

U.S. Cl. 166—274 **15 Claims**

A process for recovering petroleum from a subterranean hydrocarbon containing reservoir by flooding with a surfactant wherein the adsorption of surfactant by the reservoir rock is inhibited by treating the reservoir with a water soluble, strongly basic material having an oxygenated anion prior to injecting the surfactant. Preferably, treatment is accomplished by injecting an aqueous solution of sodium hydroxide or sodi-

um meta silicate into the reservoir in an amount sufficient to satisfy substantially all of the adsorption capacity of the reservoir matrix followed by injection of an aqueous solution of the surfactant. The aqueous solution of sodium hydroxide or sodium meta silicate and the surfactant solution can be subsequently displaced through the formation by any convenient aqueous drive fluid including water.

3,777,818

OIL RECOVERY PROCESS

David George Feuerbacher, Bellaire, and Mary Kay Hrncir Smith, Austin, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 30, 1971, Ser. No. 214,469

Int. Cl. E21b *43/22*

U.S. Cl. 166—274 **14 Claims**

A process for recovering petroleum from a subterranean reservoir by flooding with a surfactant wherein the adsorption of surfactant by the reservoir rock is inhibited by treating the reservoir with a water-soluble fluorine containing compound such as hydrofluoric acid or sodium fluoride prior to injecting the surfactant. Preferably, treatment is accomplished by injecting an aqueous solution of hydrofluoric acid or sodium fluoride into the reservoir in an amount sufficient to satisfy substantially all of the adsorption capacity of the reservoir matrix followed by injection of an aqueous solution of the surfactant. The hydrofluoric acid or sodium fluoride and the surfactant solution can be subsequently displaced through the formation by any convenient aqueous drive fluid including water.

3,777,819

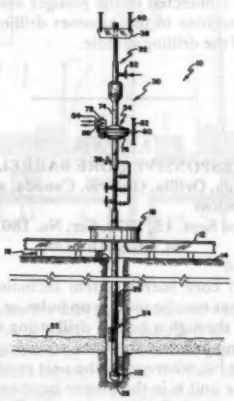
CEMENTING WELL BORE CASING

Charles G. Delano, Corpus Christi, Tex., assignor to Mustang Oil Tools, Inc., Corpus Christi, Tex.

Filed May 8, 1972, Ser. No. 251,191

Int. Cl. E21b *33/14, 19/00*

U.S. Cl. 166—285 **8 Claims**



There is disclosed a method and apparatus for cementing a tubular string in a well bore wherein the tubular string is simultaneously rotated and reciprocated while passing a cementing slurry into the well bore.

3,777,820

LPG INJECTION WITH SURFACTANT FOR RELIEVING PERMEABILITY BLOCKING

Clarence W. Weaver, Houston, and Robert R. Scroggins, Midland, both of Tex., assignors to Allied Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 87,323, Nov. 5, 1970, abandoned.

This application Aug. 17, 1972, Ser. No. 281,599

Int. Cl. E21b *43/16*

U.S. Cl. 166—305 R **3 Claims**

Introduction of mixture of LPG and surfactant for relieving blocking of well.

3,777,821

DISPERSAL OF FLAMMABLE MATERIALS

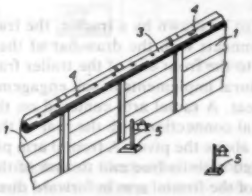
Arthur Leslie Cude, and Henry George Simpson, Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, Millbank, London, England

Filed May 21, 1971, Ser. No. 145,714

Claims priority, application Great Britain, May 27, 1970, 25,528/70

Int. Cl. A62c *3/00*

U.S. Cl. 169—2 R **2 Claims**



A method and apparatus for dispersal of flammable vapour, for example naphtha, consists of a firewall to restrain the horizontal advance of the vapour and a turbulent steam jet system positioned adjacent to the firewall to entrain the vapour together with air.

3,777,822

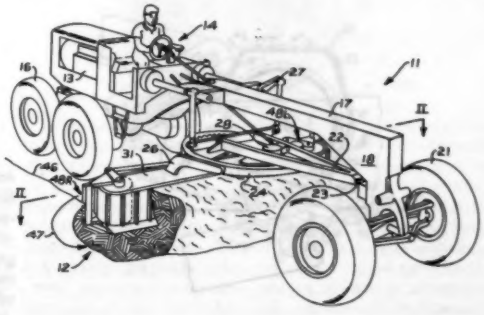
CONVEYORIZED MOTOR GRADER BLADE WITH RETRACTABLE END BITS

Robert N. Stedman, Chillicothe, Ill.; Bobby D. Griffith, Phoenix, Ariz., and Robert J. Sullivan, Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 31, 1972, Ser. No. 240,167

Int. Cl. A01b *3/00*

U.S. Cl. 172—33 **5 Claims**



A blade assembly for a motor grader having a power driven endless belt conveyor for forcibly moving material to one side

of the blade assembly is provided with end bits for facilitating operations such as bank cutting, ditching and the like in which stress may be concentrated at one end of the blade assembly. The end bits greatly reduce the wear and risk of damage which can otherwise occur at the cutting end of the conveyor. While the movement of the conveyor tends to prevent jamming of materials between the conveyor and end bit at the cutting end of the assembly, an opposite situation prevails at the discharge end. To avoid jamming at the discharge end, the end bits are retractable whereby only the bit at the cutting end need be maintained in the operative position.

3,777,823

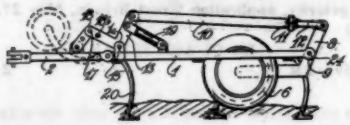
AGRICULTURAL IMPELEMENT TRAILERS

Armin E. Holfeld, Box 187, Watson, Saskatchewan, Canada

Filed Apr. 12, 1971, Ser. No. 133,306

Int. Cl. A01b *59/00*

U.S. Cl. 172—328 **5 Claims**



A trailer designed to be drawn by a tractor, the trailer having a hitch which connects with the draw-bar of the tractor. The hitch is pivoted to the front end of the trailer frame. The latter carries agricultural implements in soil engagement, and has a wheel in the rear. A radial arm centered on the wheel rises to make a pivotal connection with the rear of the frame, and has an extension above the pivot. A frontal arm pivoted to the frame is connected with its free end to that of the extension, so that a swing of the frontal arm in forward direction by a power unit will swing the radial arm and raise the frame, lifting the implements out of soil engagement. A connection from the frontal arm to the hitch lowers the latter when the frame is raised. When the hitch is disconnected from the tractor a castor wheel carried by the hitch can be swung down to support the hitch and frame in front. Supporting rear of frame on the trailer wheel leaves the greater weight of the frame and implements bearing on the draw-bar to impart more traction to the tractor wheels.

3,777,824

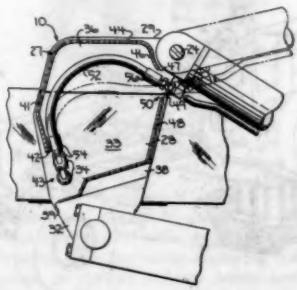
MOUNTING BRACKET FOR HYDRAULIC CYLINDERS

Rodney H. Anderson, Naperville, and John R. Muntjanoff, Aurora, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 20, 1972, Ser. No. 219,486

Int. Cl. E02f *3/76*

U.S. Cl. 172—801 **12 Claims**



A mounting bracket for attaching a hydraulic cylinder to a supporting frame including a housing rigidly secured to the frame and having a cylinder connecting pivot pin bore formed therein and a substantially closed chamber for receiving a flexible fluid hose which extends from a passage in the frame outwardly through an opening in the housing to the hydraulic cylinder with the housing shielding the fluid hose to prevent damage thereto.

3,777,825

HAMMER DRILLING MACHINE

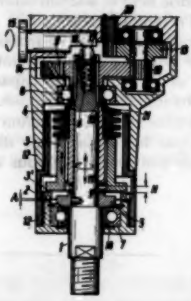
Reinhold Gullich, Struth Nr. 26, Ansbach, Germany, assignor to Firma Impex-Essen Vertrieb von Werkzaugen GmbH, Ansbach, Germany

Filed July 7, 1972, Ser. No. 269,774

Claims priority, application Germany, Sept. 4, 1971, P 21 44 449.5

Int. Cl. E21c *1/12*

U.S. Cl. 173—13 **10 Claims**



A hammer drilling machine selectively switchable between pure drilling and hammer drilling modes operates with reduced frictional heat due to the construction of the percussion mechanism. During hammer drilling there is no relative rotation between the plunger and the drilling spindle. The percussion mechanism includes two co-operable cam members, both of which are stationary when the machine is idling, and one of which is connected to the plunger and is set into rotation with the machine in the hammer drilling mode by axial displacement of the drilling spindle.

3,777,826

FLUID RESPONSIVE CORE BARREL SYSTEM

Tiete Okke Wolda, Orillia, Ontario, Canada, assignor to Boyles Industries Limited

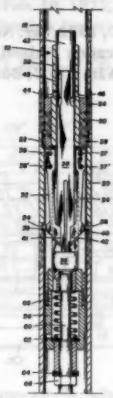
Filed Sept. 15, 1971, Ser. No. 180,596

Int. Cl. E21b *21/00*

U.S. Cl. 175—46 **16 Claims**

An improved core barrel system including a single core sampling unit that may be used in up holes or down holes. The unit is pumped through a hollow drill string until a core container in the unit reaches the core receiving position proximate the coring bit, whereupon the unit produces a signal indicating that the unit is in the proper position. A pair of flexible and resilient latch fingers automatically move into latch seats in the drill string and drilling fluid is allowed to bypass the core sampling unit to the bit for the drilling of a core. The core container in the core sampling unit receives the core. When the core container is filled, a signal is produced that indicates the desired length of core sample has been obtained.

The core sampling unit with the length of core sample in the core container automatically unlatches and the length of core is broken from the formation by pulling the drill string a short



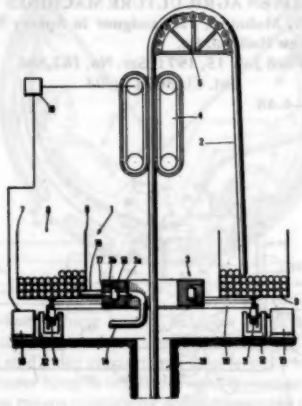
distance out of the hole. The core sampling unit is returned through the drill string by gravity in up holes or by reversing the fluid circulation in down holes and pumping the unit through the drill string.

3,777,827

DRILLING APPARATUS

Jean Thiery, Le Peco, and Pierre Grolet, Orgerus, both of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

Filed July 21, 1972, Ser. No. 273,708
Claims priority, application France, July 22, 1971, 7126960
Int. Cl. E21b *7/00, 19/00*
U.S. Cl. 175—103 **3 Claims**



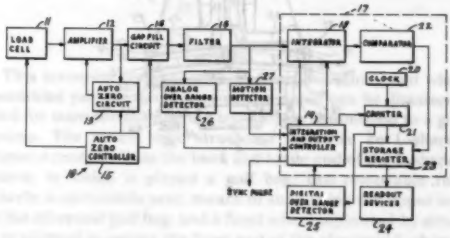
An apparatus for drilling a borehole with a drill tool driven in rotation by a motor suspended from the end of a drill column constituted by a flexible drill pipe, this apparatus including a basket for storing the flexible pipe, this basket having an annular shape with a vertical axis, motor means driving said annular basket in rotation about its vertical axis, means for supplying the flexible pipe with drilling fluid during the rotation of said basket, at least one means for driving the flexible pipe between said storage basket and said driving means, wherein said fluid supplying means are constituted by a hydraulic rotary coupling having an annular shape, centered on said vertical axis of the annular storage basket, said hydraulic coupling having an inner diameter at least equal to the maximum outer diameter of said flexible pipe, said vertical axis of the annular basket being substantially in line with the axis of the drilled borehole, said driving means being placed substantially along the borehole axis for displacing said flexible pipe along said axis, said guiding means being adapted to place siad flexible pipe substantially along the borehole axis.

3,777,828

ELECTRONIC WEIGHING SYSTEM WITH DIGITAL READOUT

Stanley A. Dietemeyer, Sylvania, Ohio, assignor to Reliance Electric Company, Toledo, Ohio

Filed Sept. 30, 1971, Ser. No. 185,231
Int. Cl. G01g *23/14, 3/14*
U.S. Cl. 177—165 **9 Claims**



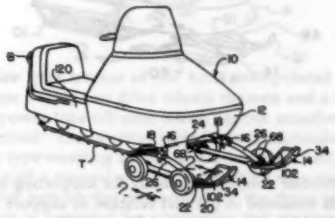
An improved electronic weighing system with a digital readout. A transducer establishes an analog signal corresponding to an unknown weight. The analog signal is amplified, digitized with an analog-to-digital converter and applied to the digital readout. Circuitry is provided for automatically zeroing the analog portion of the system while the transducer output is momentarily interrupted and for filling gaps in the analog signal resulting from the interruption of the transducer output. The digital portion of the system also includes tare weight provisions for modifying the indicated weight, and circuitry for changing the range and the resolution or increment of the weighing system.

3,777,829

SNOWMOBILE WHEEL SUPPORT COMBINATION

Arthur L. Rogers, Livonia, Mich., assignor to Johnson Stamping and Fine-Blanking Company, Farmington, Mich.

Filed Nov. 22, 1971, Ser. No. 201,031
Int. Cl. B62m *27/02*
U.S. Cl. 180—5 R **12 Claims**



A wheel support combination for a snowmobile is disclosed, wherein front end wheel and bracket units are manually attachable to and removable from the skis with minimum effort.

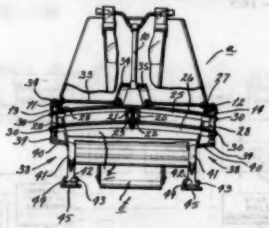
A preferred method of attachment of the wheel and bracket units is also disclosed.

3,777,830

STABILITY-PRESERVING STEERING SUSPENSION FOR SNOWMOBILES

Frank G. Christensen, Don Mills, Ontario, and Rafael T. Wulff, Dorset, Ontario, both of Canada, assignors to Zeverly L. Lapin, Los Angeles, Calif.

Filed Mar. 20, 1972, Ser. No. 236,353
Int. Cl. B62m 27/00
U.S. Cl. 180—5 R 2 Claims



A stability-preserving, self-banking steering suspension for snowmobiles. In the preferred embodiment, the steering bushings are held by parallel leaf springs deflectable in an upward and aft sloping lateral plane. Steerable ski legs extend inboard to trunnion brackets which are mounted directly to the skis. Spring deflection under impacts does not lessen the steering stability, as may occur when the skis alone are sprung.

3,777,831

DIRIGIBLE SYSTEM FOR SNOWMOBILES

Dean H. Hale, 2500 N. Main, Logan, Utah

Filed Apr. 3, 1972, Ser. No. 240,596
Int. Cl. B62m 27/02
U.S. Cl. 180—5 R 3 Claims

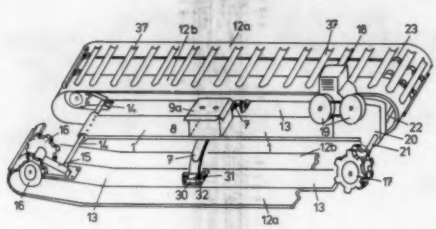
A snowmobile comprising a body for supporting a driver, a pair of skis mounted in parallel relation to support at least a portion of said body, steering mechanism connected to said skis and operable to displace said skis in a manner to provide directional control for said snowmobile, and means actuated by said steering mechanism for displacing said body to shift the weight of the driver toward the direction of a desired turn. Method and several forms of apparatus are disclosed.

3,777,832

CHASSIS STRUCTURE FOR A MOTOR SLEIGH OR EQUIVALENT VEHICLE

Markku Merenheimo, Oulu; Manuno Ruuska, Muhos, and Risto Saivisalmi, Oulu, all of Finland, assignors to Valmet Oy, Helsinki, Finland

Filed Apr. 7, 1972, Ser. No. 242,183
Claims priority, application Finland, Feb. 21, 1972, 462/72
Int. Cl. B62m 27/02; B62d 55/08
U.S. Cl. 180—5 R 9 Claims



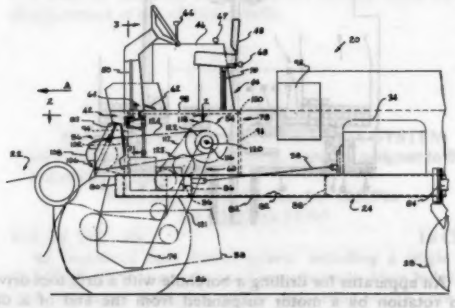
A motor sleigh or the like having a chassis provided with an elongated spring in the direction of travel of the sleigh in the middle thereof. The ends of the spring carry supports for the wheels of the track mat. An auxiliary body has one end supported in the center of the spring and a forwardly extending part carrying the steering column.

3,777,833

STEERING MECHANISM FOR HYDROSTATICALLY DRIVEN AGRICULTURE MACHINES

Karl E. Koch, Mohnton, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed July 15, 1971, Ser. No. 162,886
Int. Cl. B62d 11/04
U.S. Cl. 180—6.48 8 Claims



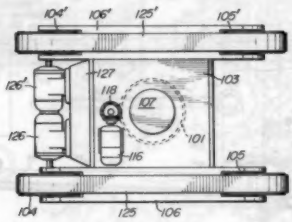
A self-propelled windrower is driven through two hydrostatic units coupled respectively to the front drive wheels and is controlled in direction by a steering wheel connected to the hydrostatic units by a steering mechanism provide a substantial movement of the steering wheel for a change in the hydrostatic units.

3,777,834

MAGNET VEHICLE

Michito Hiraoka, Ageo, and Yoshihiko Hikita, Fukaya, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Division of Ser. No. 36,753, May 13, 1970, Pat. No. 3,682,265.
This application Feb. 10, 1972, Ser. No. 225,195
Claims priority, application Japan, May 16, 1969, 44/37383; Aug. 1, 1969, 44/60410
Int. Cl. B62d *11/00, 55/00*
U.S. Cl. 180—9.44 2 Claims



A magnet vehicle supportedly adhered to and adapted to run over an inclined wall surface of a structural member made of a strong magnetic material such as iron and steel, characterized in that said vehicle can be altered of its direction of travel as desired on said surface.

3,777,835

ONE-WHEEL VEHICLE

Richard Curtis Bourne, 4401 S. 27th St., Apt. F13, Lincoln, Nebr.

Filed Jan. 14, 1972, Ser. No. 217,796
Int. Cl. B62k *1/00*
U.S. Cl. 180—10 8 Claims

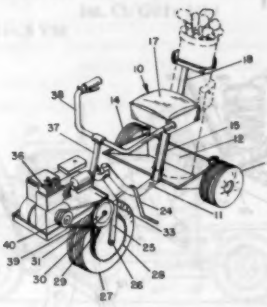
A one-wheel vehicle having an outer hoop, an inner carriage movably mounted inside said outer hoop, engine means for driving said inner carriage in a counterclockwise direction upon said outer hoop to impart forward movement of the vehicle, steering means comprising a seat supporting the occupant in a semi-reclining position movably suspended from said inner carriage and being pivotal in a direction transverse to the movement of said vehicle and means for swinging said seat in a pendulum-like movement. In a further aspect hereof, said outer hoop comprises a cylinder having a truncated cone attached to each end thereof thereby defining three stable rest positions for said vehicle. In a still further aspect hereof, said outer hoop comprises two separate hoops spaced apart having an outer band extending threrearound wider than the space between said two hoops and being fastened to each, said spacing providing a track guiding said inner carriage upon said band.

3,777,836

MOTOR DRIVEN GOLF CART

Warren D. Riza, P.O. Box 78, Cleburne, Tex.

Filed Sept. 22, 1971, Ser. No. 182,756
Int. Cl. B62d *21/12*
U.S. Cl. 180—26 2 Claims



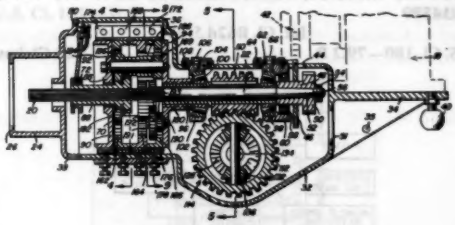
This invention consists of seven basic structures that when assembled provide a one man golf cart that can be dissassembled for transportation in the trunk of an automobile to a golf course. The seven basic structures comprise an L-shaped frame; a receptacle on the back and lower end of the L-shaped frame; in which is placed a golf bag; two removable rear wheels; a removable seat; means of supporting the upper end of the aforesaid golf bag; and a front wheel supported by structure adapted to secure the front end of the aforesaid L-shaped frame are all part of this novel invention. The above mentioned structure of the aforesaid front wheel also supports removable structure on which is located the internal combustion engine that propels the golf cart by means of both belt and chain drive mechanism. A handle bar is supported by the same structure that supports the aforesaid internal cumbustion engine.

3,777,837

TRACTOR

Murry D. Harper, 218 22nd St., Dunbar, W. Va.

Filed Mar. 2, 1971, Ser. No. 120,172
Int. Cl. B60k *17/06, 23/06*
U.S. Cl. 180—70 R 13 Claims



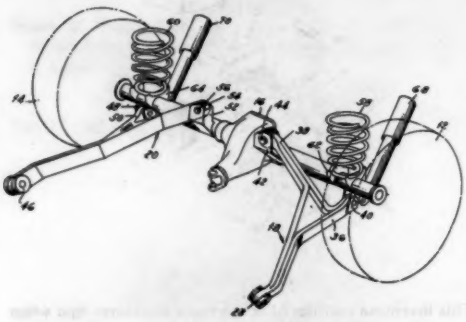
A garden type tractor of the hand manipulated and controlled type having two drive wheels thereon and a forwardly directed power take off onto which various attachments may be connected. The tractor includes a transmission of the planetary type enabling a change in drive speed and direction by the use of a manual shifting lever which may move into a position for locking the differential for the drive wheels. An attachment is provided for converting the tractor to a four wheel type and including an occupants seat for convenience and ease of control of the tractor. The drive train of the tractor includes an automatic clutch, chain drive, transmission and worm drive to the differential which provides a versatile drive arrangement.

3,777,838

REAR SUSPENSION SYSTEM FOR A MOTOR VEHICLE

John V. Barnes, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 24, 1972, Ser. No. 237,821
Int. Cl. B60g 9/00
U.S. Cl. 180—71 1 Claim



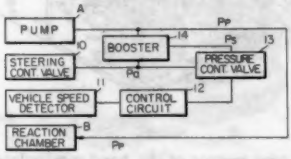
A suspension system for the driving wheels of a motor vehicle that are interconnected by a rigid axle housing. In the preferred embodiment, the axle housing is positioned with respect to the vehicle's chassis frame solely by a pair of arms. Each arm is connected to the vehicle frame by a single pivot. A pair of pivots that are both vertically and horizontally spaced apart connect each arm to the axle housing.

3,777,839

HYDRAULIC-POWER CONTROL DEVICE FOR POWER-ASSISTED STEERING SYSTEM

Hiromichi Uchiyama, Tokyo, and Naohiko Inque, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Dec. 22, 1971, Ser. No. 210,809
Claims priority, application Japan, Dec. 29, 1970, 45/120692; Dec. 29, 1970, 45/120693; Mar. 16, 1971, 46/14288; Mar. 16, 1971, 46/14504; Mar. 17, 1971, 46/14589
Int. Cl. B62d 5/08
U.S. Cl. 180—79.2 R 29 Claims



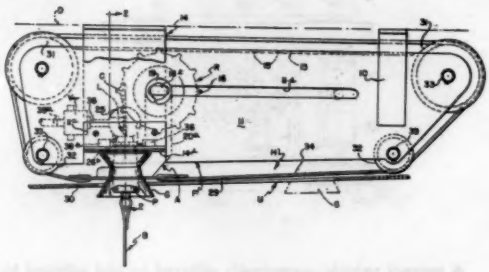
Herein disclosed is a hydraulic-power control device of a servo mechanism for automotive power-assisted steering systems. The control device includes a booster unit by which the working fluid pressure to be directed to the reaction chamber of the servo mechanism is multiplied depending upon several ranges of the vehicle driving speed so as to provide effortless steering performance during relatively low-speed driving and stabilized steering performance during relatively high-speed driving especially under the straight-ahead condition of the steering system.

3,777,840

DOOR MOUNTED SEAT BELT LOCKING RETRACTOR

Irlin H. Botnick, 3155 Kersdale Rd., Pepper Pike, Ohio, and Lewis H. Polster, Shaker Heights, Ohio, assignors to said Botnick, by said Polster

Filed Apr. 23, 1971, Ser. No. 136,955
Int. Cl. B60r 21/10
U.S. Cl. 180—82 C 28 Claims



In a door mounted seat belt retracting and locking unit, one belt end is secured to an anchor plug lockable in a translatable, cable-guiding anchor bracket by a vacuum bellows actuated latch; a flexible cable from the inner plug end being wound on a spring return-biased reel, having sprocketed flanges engaged in a rack in a unit base or frame attached to the vehicle door. Upon a permitted door opening, with plug withdrawal and cable unreeling, the reel with connected anchor bracket walks forwardly along the door carrying the belt away from the seat and winding the spring of the reel, which upon door closure automatically retracts the cable, the reel and anchor bracket walking back into position for locking by the latch control system upon the motor starting. The bracket slot at all times is covered by a roller-guided flexible band running from one side of the bracket around the unit frame back to the other bracket side. Variants are disclosed.

As the installation of seat belts in automotive vehicles, particularly passenger autos, is now quite widespread, the personal safety advantages of seat belt equipment, the environment of use, and the ordinary use thereof require here no particular discussion. However, safety studies evaluating the now considerable experience with belts have shown that there is extensive non-use of installed belts in consequence of carelessness, laziness, inadvertance or forgetfulness of drivers or passengers in attending to the simple operation of picking up and buckling the seat belt ends immediately upon entering the vehicle.

3,777,841

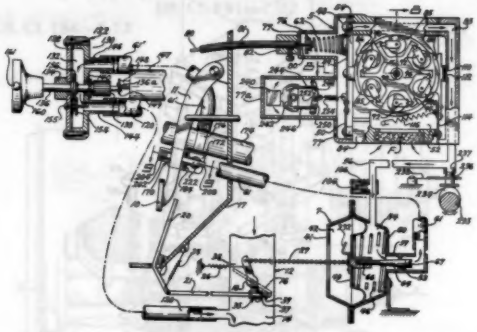
AUTOMOTIVE SPEED CONTROL SYSTEM

Robert H. Thorner, 8750-F W. Chicago Blvd., Detroit, Mich.

Continuation-in-part of Ser. No. 668,121, Sept. 15, 1967, Pat. No. 3,528,523, which is a division of Ser. No. 430,910, Feb. 8, 1965, Pat. No. 3,343,423. This application June 3, 1970, Ser. No. 43,122
Int. Cl. B60k 31/00
U.S. Cl. 180—108 38 Claims

An important disclosure herein comprises an automatic speed control system for an automotive vehicle including mechanism providing a selective mode of operation which enables the driver when he chooses to resume a previously set regulated speed subsequent to slowing or stopping the vehicle. This selective control mechanism enables "automatic" reactivation of the speed control device in response to a change in accelerator movement and is accomplished by selective advancement of the accelerator slightly beyond its normal driving position to initiate automatic acceleration to the regulated

speed. Several forms of restraining means are provided to make this mode of operation completely safe by automatically rendering the device inoperative, for example when the driver opens a vehicle-door. In another form of restraining means, the device is rendered completely inoperative whenever the



vehicle speed falls below a set value, such as 20 mph for example. Also, specific forms of curve-compensation may be added to this or any speed control system to provide additional safety, in which the regulated vehicle speed is automatically caused to reduce temporarily on road curves, and to return to the regulated speed when the road is again straight.

3,777,842

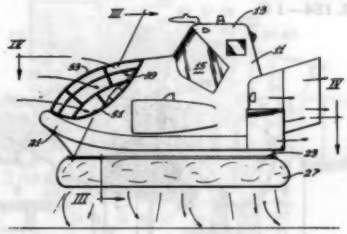
AIRCAR

Harry A. Laufman, 1510 E. Colorado Blvd., Glendale, Calif.

Continuation of Ser. No. 24,057, March 26, 1970, abandoned. This application Apr. 6, 1972, Ser. No. 241,518

Int. Cl. B60v *1/02*

U.S. Cl. 180—117 **9 Claims**



A vehicle having an air intake system at the forward end thereof, which directs a portion of the ingested air downwardly to fill a pliable doughnut-shaped skirt extending around the vehicle; the air pressure then allows air to move under the skirt so as to lift the entire vehicle. The remaining portion of the air is directed through the vehicle and out the after end thereof for propulsion and the direction of movement of this air is controlled by a plurality of rudders so that the vehicle may be turned or moved in reverse. The relative volumes of air directed through the vehicle and out from under the vehicle may be adjusted by an angularly movable plate positioned relative to an engine and a propeller.

3,777,843

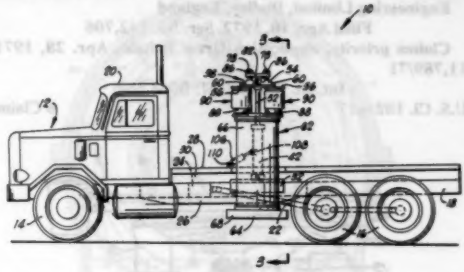
SEISMIC VIBRATOR SYSTEM

Delbert W. Fair; Graydon L. Brown, and J. H. Miller, Jr., all of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Oct. 18, 1971, Ser. No. 190,161

Int. Cl. G01v *1/14*

U.S. Cl. 181—.5 VM **2 Claims**



A seismic vibrator system for installation on the frame of a ground vehicle including a pair of two-way power cylinders each pivotally secured at one end thereof to the frame and fixedly secured at the opposite end thereof to a cross member. A vibrator is connected to each end of the cross member by means of a vibration-isolating air spring. The lower ends of the vibrators are secured to an earth-engaging base. Lifting members, interconnecting the vibrator and the cross member, are disclosed for lifting the vibrators and base in response to extension of the power cylinders. Extension and retraction of the two-way power cylinders alternately raises the vibrators and base from the ground for travel and lowers them to the ground for transmission of seismic shock waves into the ground. The cross member and power cylinders are adapted to be vibrationally isolated from the vibrators and base when the base is in contact with the ground. In operation the vehicle is partially supported by the base and the vibrators acting through the vibration isolating air springs.

3,777,844

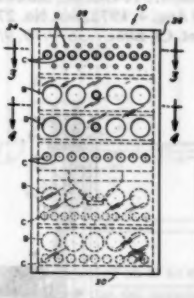
ADJUSTABLE SPEAKER CABINET

Rubein V. Johnson, 2432 Court St., Muskogee, Okla.

Filed Oct. 24, 1972, Ser. No. 300,177

Int. Cl. G10k *13/00*; H04r *1/28*

U.S. Cl. 181—31 B **4 Claims**



An acoustical cabinet for housing one or more loud speakers is described. The cabinet is broken up into a plurality of separate chambers and resonance volumes by means of horizontal partitions across the rectangular chamber. Each of the horizontal dividing walls has a plurality of circular openings therein. The speaker or speakers is mounted to a horizontal baffle across the entire cross section of the chamber. The resonance volumes above the speaker are par-

tially vented, through pluralities of circular openings in the front panels of those chambers. The chambers below the speaker are likewise vented to the back through pluralities of circular openings.

3,777,845

HYDRAULICALLY OPERATED ACCESS EQUIPMENT

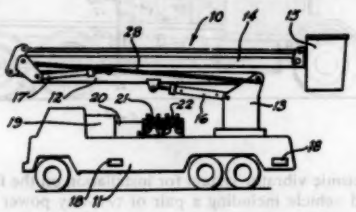
Denis Henry Ashworth, Dudley, England, assignor to Simon Engineering Limited, Dudley, England

Filed Apr. 10, 1972, Ser. No. 242,706

Claims priority, application Great Britain, Apr. 28, 1971, 11,789/71

Int. Cl. B66f 11/04; B06c 5/06

U.S. Cl. 182—17 **6 Claims**



Hydraulically operable access equipment, usually but not necessarily vehicle mounted, and of the kind comprising a boom structure consisting of a plurality of booms pivotally connected together in end to end relationship, hydraulic actuators with an associated hydraulic control system for moving the boom structure between a stowed position wherein at least some of the booms lie parallel with one another in a substantially horizontal direction and an extended position wherein the free end of the boom structure is raised to an elevated position, characterised by the provision of secondary, normally closed, inlet and outlet ports to the oil chambers of at least some of the hydraulic actuators, and an auxiliary system comprising a pump and flexible hoses capable of being extended from such pump for connection to the secondary inlet and outlet ports of each said actuator, whereby such actuators may be operated to permit movement of the boom structure to its stowed position by use of said auxiliary hydraulic system.

3,777,846

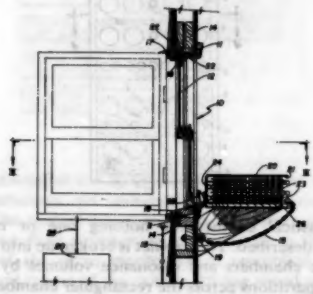
FIRE ESCAPE

Carl A. Josephson, 1534 Graham St., Simi Valley, Calif., and Albert R. Josephson, 310 Oak St., Shrewsbury, Mass.

Filed Aug. 4, 1972, Ser. No. 278,118

Int. Cl. E06c 1/56, 9/10, 9/14

U.S. Cl. 182—78 **7 Claims**



This invention is a fire escape system in which a window can be swung open; simultaneous with the swinging a descending device is lowered to the ground from the window ledge.

3,777,847

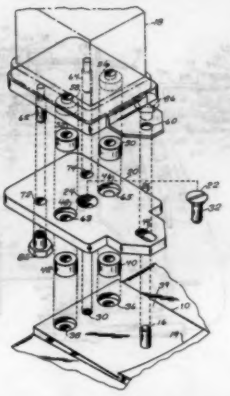
COUPLING PLATE

Thomas R. Lawless, 2218 Fairport Ave., Dayton, Ohio

Filed July 6, 1971, Ser. No. 159,619

Int. Cl. F01m 1/00

U.S. Cl. 184—1 R **2 Claims**



A coupling plate for coupling an oil cooler to an engine block which has lost its oil cooler mounting ears is disclosed. The coupling plate has oil ports therein for transferring oil between the engine block and oil cooler. In the area between the oil ports within the coupling plate is placed a countersunk coupling hole for connecting the coupling plate to the engine block. Oil cooler stud holes for connecting oil cooler studs of the oil cooler to the coupling plate are provided in the coupling plate. The coupling plate has an elliptical engine block stud hole therein for holding the coupling plate between the oil cooler and the damaged engine block. The coupling plate is used to connect an oil cooler to an engine block which has losted its oil cooler ears.

3,777,848

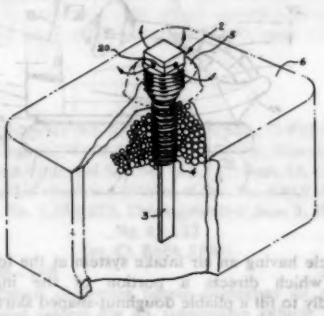
AIR BREATHER FITTING FOR RESERVOIRS

Langdon C. Schaeffer, Webster Groves, Mo., and Roland C. Thomas, Dover, Ky., assignors to Emerson Electric Company, St. Louis County, Mo.

Filed Apr. 14, 1972, Ser. No. 244,117

Int. Cl. F01m 1/10

U.S. Cl. 184—1 C **9 Claims**



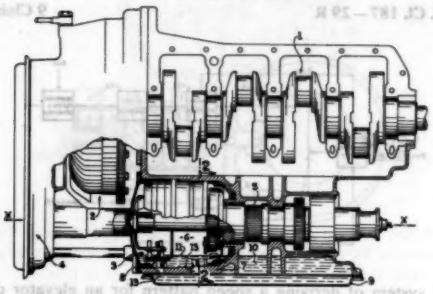
A device for equalizing pressure in agitated oil in a closed container without permitting oil escape is provided and includes a cap having a pervious shielding element depending from it. The shielding element prevents bubble formation in a breather passage extending through the cap by dissipating any bubbles formed, before their entrance into the breather passage, thereby permitting air release while preventing oil loss through the breather passage.

3,777,849

AUTOMATIC TRANSMISSION CASING UNIT FOR AN AUTOMOBILE VEHICLE

Jean Piret, Bougival, France, assignor to Automobiles Peugot, Paris and Regie Nationale Des Usines Renault, Billancourt, France

Filed July 6, 1971, Ser. No. 160,027
Claims priority, application France, July 7, 1970, 7025104
Int. Cl. F01m 1/02
U.S. Cl. 184—6.12 6 Claims



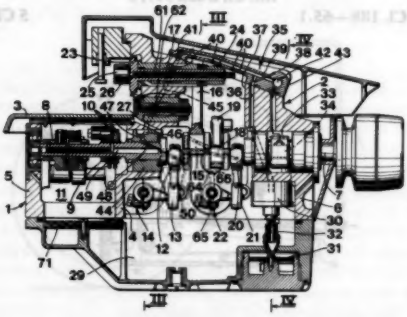
A casing defines a chamber which contains a gear change mechanism for a vehicle and communicates by way of at least one opening with a sump under the chamber. The opening has a wall portion which tapers in a direction opposed to the direction in which oil is driven by the change mechanism whereby the change mechanism drives the oil into the sump in the manner of a centrifugal pump.

3,777,850

SEWING MACHINE LUBRICATING SYSTEM

Nerino Marforio, Milan, Italy, assignor to S.p.A. Virginio Rimoldi & C.

Filed Dec. 30, 1971, Ser. No. 214,163
Claims priority, application Italy, Feb. 17, 1971, 20656 A/71
Int. Cl. D05b 71/00
U.S. Cl. 184—6.15 2 Claims



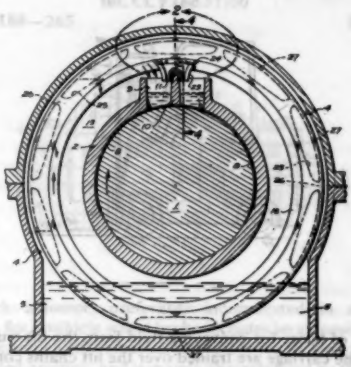
An improved lubricating system for a high speed sewing machine in which all of the moving parts and a portion of the stationary parts of the machine frame contain a series of interconnecting passages to form a high pressure internal lubricating system. Also included is a supply distributor which directs the lubricant into the interconnecting passages and which also provides a low pressure or spray type of lubricating system that affects external lubrication of the various machine operating parts.

3,777,851

SHAFT LUBRICATOR OPERABLE AT LOW SPEED

Paul T. Mitchell, and Peter A. Pagan, both of 2277 E. 16th St., Los Angeles, Calif.

Filed Mar. 16, 1972, Ser. No. 235,164
Int. Cl. F16n 25/04
U.S. Cl. 184—63 8 Claims



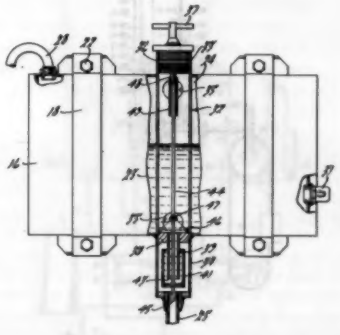
A lubricator for shafts, such as ship propeller shafts, during a rotation of such shafts at low speeds, the lubricator including a ring of lubricant containers which rotate with the shaft and are caused to dip in an oil sump, then carry the oil above the upper side of the shaft, and discharge the oil by gravity into a collector for distribution into the region between the bearing and the shaft; the lubricator being incorporated in a centrifugally operating lubricating means which takes over the lubricating function when the shaft speed increases.

3,777,852

AUTOMATIC OIL LEVEL REGULATOR

Eugene J. Samalon, Racine; Gilbert C. Lamb, Jr., Milwaukee, and Ervin C. Lentz, Racine, all of Wis., assignors to Tenneco Inc., Racine, Wis.

Filed Feb. 25, 1972, Ser. No. 229,389
Int. Cl. F01m 11/12
U.S. Cl. 184—103 R 5 Claims

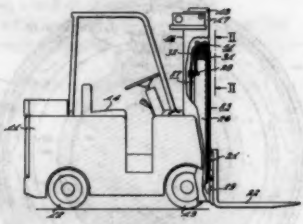


A device which senses the level of oil in an engine crankcase and automatically replenishes the oil supply when needed. The device comprises an oil reservoir having an oil level sensing tube and an oil feed tube leading to the crankcase. A valve automatically shuts off oil flow from the reservoir when its filler plug is removed. This valve comprises a cup surrounding a downspout from the reservoir and normally biased to closed position. A rod extends upwardly from the cup and is engageable by the filler plug to open the valve, the cup acting as an air trap.

3,777,853
HOSE GUIDE FOR LIFT TRUCK

Bernard G. Miller, Tinley Park, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Apr. 5, 1972, Ser. No. 241,337
Int. Cl. B60b *9/20*
U.S. Cl. 187—9 5 Claims

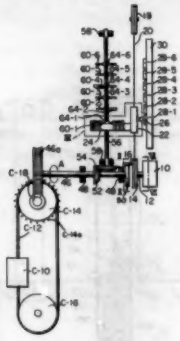


A pair of hoses for conveying fluid from the lift truck to a jack on the carriage are trained over the lift chains connected to the carriage and are held in the place on the lift chains as the chains and hose pass over a pair of pulleys by rollers disposed above the hoses.

3,777,854
ELEVATOR FLOOR SELECTOR

Yasuhiko Ozawa, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1971, Ser. No. 202,845
Int. Cl. B66b *1/52*
U.S. Cl. 187—29 R 3 Claims

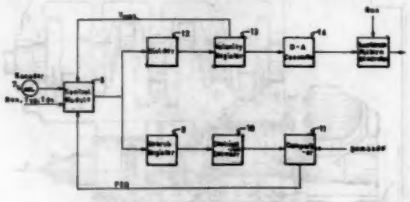


A plurality of control discs are mounted on a vertical shaft at those positions corresponding to those floors of a building. The shaft is rotated in response to the travel of an elevator car. An advance element carrying a plurality of deceleration switches is moved ahead of the travelling car at a predetermined advance range. When the advance element reaches and stops at the particular calling floor, an actuator disposed on that disc for the calling floor continues to be rotated to successively operate the switches to decelerate the car until it lands at the calling floor.

3,777,855
PATTERN GENERATOR FOR THE CONTROL OF MOTION OF A BODY MOVABLE OVER A PREDETERMINED PATH

Graham Edward Boyldew, Randwick, New South Wales, and John Lindsay Shumack, Grays Point, New South Wales, both of Australia, assignors to Elevators Pty. Limited, Waterloo, New South Wales, Australia

Filed July 12, 1972, Ser. No. 271,083
Claims priority, application Australia, July 19, 1971, PA 5590
Int. Cl. B66b *1/16*
U.S. Cl. 187—29 R 9 Claims

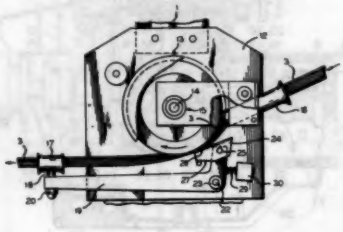


A system of deriving a speed pattern for an elevator car power circuit which comprises utilizing electrical impulses whose number is a measure of distance along the shaft. Firstly determining how far the car has to travel to a destination which may be either its next stop or where it will first reach maximum speed. Secondly, producing a high frequency train of impulses indicative of the necessary travel, and producing a second train of impulses indicative of progressive movement of the car towards the destination. Thirdly, totalling in a counter the first series of impulses and subtracting therefrom the second series of impulses, and fourthly, deriving a control signal from a digital to analogue converter responding to the total in the counter and applying it to the power circuit for the car to determine the speed of the car.

3,777,856
ROVING COUNTER AND BRAKE

Charles R. Gardner, Glendale, and David W. Goelz, Burbank, both of Calif., assignors to Republic Corporation, Los Angeles, Calif.

Filed Oct. 6, 1971, Ser. No. 186,920
Int. Cl. B65h *59/16*
U.S. Cl. 188—65.1 5 Claims



A braking and counting arrangement for roving which includes a pawl responsive to the amount of tension in the roving; a wheel coupled to a counter mechanism; and guide members arranged to position the roving between the pawl and the wheel. When tension is applied to the roving, the roving moves freely and engages the wheel which rotate and allows the counter to register the amount of roving used. When tension is released from the roving, the pawl is urged against the roving and the wheel, thus restraining further movement of the roving and the wheel.

3,777,857

HYDRAULIC BRAKING SYSTEM FOR VEHICLES

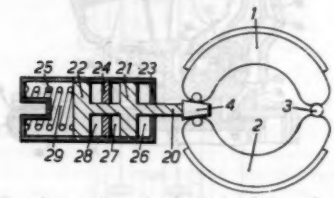
Michael James Hughes, Lichfield, England, assignor to Girling Limited, Birmingham, England

Filed July 29, 1971, Ser. No. 167,094

Claims priority, application Great Britain, Aug. 8, 1970, 38,310/70

Int. Cl. F16d 65/24

U.S. Cl. 188—170 4 Claims



In a fluid-pressure operated braking system for vehicles incorporating internal shoe-drum brakes the brake shoes are separated to apply the brake by a wedge actuated by pistons arranged in tandem in a cylinder and individually acted upon by pressure fluid derived from separate sources under manual control.

3,777,858

RAILWAY VEHICLE BRAKING SYSTEMS

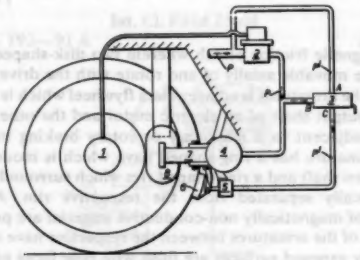
Peter Murphy, Tyselex, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed Mar. 28, 1972, Ser. No. 238,789

Claims priority, application Great Britain, Mar. 30, 1971, 8,166/71

Int. Cl. B60t 8/12

U.S. Cl. 188—181 R 8 Claims



A railway vehicle braking system comprises a friction brake and a wiper device arranged to wipe the tire of a vehicle wheel or the rail on which the wheel runs to increase the coefficient of friction between the tire and rail. A skid sensing device is operable in response to excessive deceleration of the wheel, when the brake is applied, to reduce the braking effort, and an actuator applies the wiper device in response to operation of the skid sensing device. The wiper may simply clean the tire of grease and moisture, or apply a coating of friction material, or both.

3,777,859

LOCKING MEANS FOR VEHICLE WHEEL BRAKES

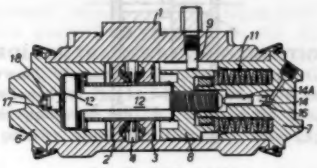
Michael James Hughes, Tyseley, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed June 16, 1971, Ser. No. 153,671

Claims priority, application Great Britain, June 24, 1970, 30,651/70

Int. Cl. F16d 51/00

U.S. Cl. 188—265 8 Claims



A lock actuator, preferably incorporated in a wheel cylinder, for a vehicle wheel brake includes an extensible strut and a friction clutch selectively operable for locking the strut in extended position, and is mainly characterized by the provision of a fluid pressure actuated motor for effecting engagement of the clutch whereby to obtain rapid and positive response to selection of the locked condition. The said motor may be opposed and normally overpowered by a second motor acting in the opposite direction, clutch engagement being effected by disabling the second motor which the first remains operative.

3,777,860

HYDRODYNAMIC BRAKE FOR VEHICLES ESPECIALLY FOR MOTOR VEHICLES

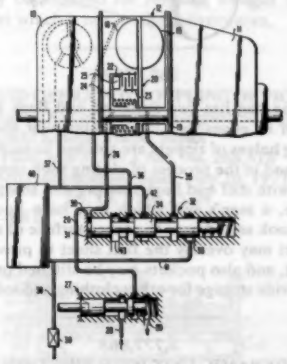
Hans-Joachim M. Forster, Stuttgart, and Werner Hensel, Berkheim, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Untertuerkheim, Germany

Filed May 24, 1971, Ser. No. 146,053

Claims priority, application Germany, May 23, 1970, P 20 25 306.9

Int. Cl. F16d 57/02

U.S. Cl. 188—291 17 Claims



A hydrodynamic brake for vehicles, especially for motor vehicles, with at least one stationary and one rotating blade wheel, whereby the latter is adapted to be connected with the drive shaft by way of an engageable clutch which is controllable automatically in dependence on the actuation of the vehicle brake.

3,777,861

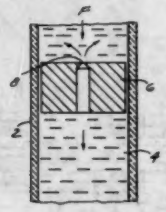
SHARP EDGE ORIFICE DASHPOT TIMER

David S. Breed, Box 270, R.D. 2 Hillcrest Rd., Boonton Twp., N.J.

Filed Feb. 16, 1971, Ser. No. 115,490. The portion of the term of this patent subsequent to Feb. 16, 1988, has been disclaimed.

Int. Cl. F16g 9/02

U.S. Cl. 188—317 9 Claims



The dashpot timer of this invention includes a substantially cylindrical glass tube in which travels a piston having a diameter slightly less than that of the interior of the tube. A gas defines the medium in the cylinder in which the piston containing a sharp edge orifice is adapted to travel. The flow ingenerated in the cylinder is predominately an inertial flow through the sharp edge orifice with the shear flow and pressure flow between the piston and cylinder being relatively insignificant. The device of the present invention operates in the inertial flow region whereby the viscosity effects are relatively small compared with the inertial effects of the fluid.

3,777,862

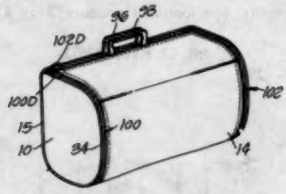
TRAVELERS BAG

Walter J. Zipper, 463 Mesa Rd., Santa Monica, Calif.

Filed May 22, 1972, Ser. No. 255,337

Int. Cl. A45c 7/00

U.S. Cl. 190—43 2 Claims



A traveling bag has two stiffened end flaps each stitched along one of its edges to a large rectangular sheet of fabric. Cooperating halves of zippers are stitched to such sheet and to such flaps; and in the process of closing such zippers, a closed bag results with stiff end flaps that prevent sharp creasing of, for example, a man's suit which may have been previously hung on a hook sewed onto the inner surface of such sheet. A second sheet may overlay the first sheet to provide a pocket for such suit, and also pockets may be stitched on said second sheet to provide storage for other clothing and toilet articles.

3,777,863

HYDRODYNAMIC UNIT WITH FRICTION CLUTCH

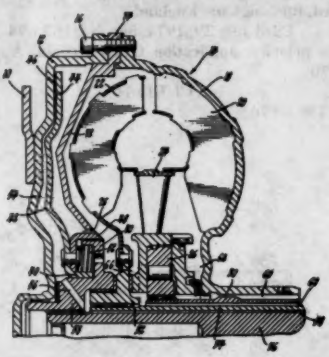
Howard E. Chana, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 19, 1971, Ser. No. 200,399

Int. Cl. F16d 39/00

U.S. Cl. 192—3.33 4 Claims

Hydrodynamic torque-transmitting unit having a engageable friction clutch for establishing a selective mechanical drive in parallel with the hydraulic drive through the unit which is located directly between and the front cover of the housing a disk-like shroud fixed to the housing so that fluid forces generated by rotating unit rotor members do not adversely affect clutch operation.



3,777,864

AIR COOLED MAGNETIC CLUTCH AND BRAKE

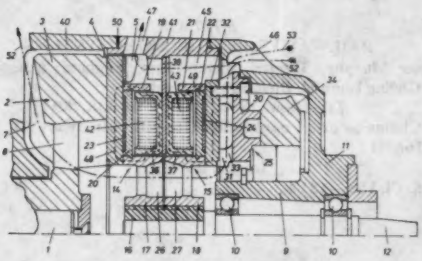
Willi Hermann Marti, Basel, Switzerland, assignor to Delmoran AG, Basel, Switzerland

Filed Dec. 3, 1971, Ser. No. 204,635

Claims priority, application Switzerland, Dec. 15, 1970, 18575/70

Int. Cl. F16d 67/06

U.S. Cl. 192—18 B 22 Claims



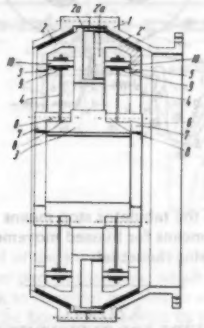
A magnetic friction clutch wherein two disk-shaped armatures are movable axially of and rotate with the driven shaft. One of the armatures is adjacent to a flywheel which is rotated by the output shaft of an electric motor and the other armature is adjacent to a stationary or rotary braking member. Each armature has a ring-shaped nave which is mounted on the driven shaft and a ring-shaped rim which surrounds and is magnetically separated from the respective rim. Annular facings of magnetically non-conductive material are provided on each of the armatures between the respective nave and rim and their exposed surfaces are flush with pole faces provided on the corresponding rim and nave. Two windings are mounted in the space between the two armatures and one thereof is energizable to cause the facing and the pole faces of one armature to bear against the flywheel, the other winding being energizable to cause the facing and the pole faces of the armature to bear against the braking member. Channels in the braking member, naves of the armatures and the flywheel serve to convey streams of cooling air which are induced by annuli of blades on the flywheel. The material of those portions of each rim and nave which are adjacent to the respective pole faces exhibits the same resistance to wear as the material of the facings.

3,777,865

COMBINED CLUTCH AND FLEXIBLE COUPLING

Jurgen Walter, Markische strasse 24, and Bernhard Hackforth, Heerstrasse 52d, both of Wanne-Eickel, Germany

Filed Mar. 20, 1972, Ser. No. 235,935
Int. Cl. F16d *13/34*
U.S. Cl. 192—70 14 Claims



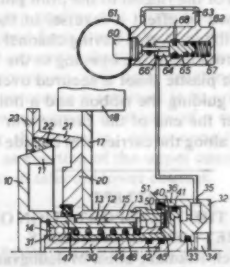
Combined clutch and flexible shaft coupling, wherein each of two ring-shaped coupling parts movable axially with respect to each other are connected with a hub part, that is adapted to be fastened on a first shaft, by at least one metal spring disc which is yieldable in an axial direction. The movable coupling parts are pressable in opposite directions from a middle resting position in which the clutch is disengaged, with outer friction surfaces on the coupling parts spaced from inner friction surfaces that are situated opposite them, on the coupling case; such case is adapted to be connected to a second shaft. The movable coupling parts are flexibly affixed in all directions, the outer edges of the spring discs being secured to the respective axially movable parts of the coupling by elastic intermediate members.

3,777,866

FLUID PRESSURE RELEASED CLUTCH FOR FANS

Arthur Ernest Henry Elmer, Painswick, England, assignor to Dynair Limited, Gloucestershire, England

Filed Mar. 6, 1972, Ser. No. 232,089
Claims priority, application Great Britain, Mar. 11, 1971, 6,633/71
Int. Cl. F16d *25/08*
U.S. Cl. 192—91 A 6 Claims



A rotary cooling fan for a vehicle motor including a friction clutch engaged by relative axial movement between two clutch members, means for driving the input clutch member at one end of the fan hub, a fluid operated ram including a ram piston and ram cylinder mounted within the hub, means for admitting fluid to the ram from the other end of the hub, spring means acting directly between the ram piston and cylinder to engage the clutch, and two thrust bearings connected respectively between the two parts of the ram and the two clutch members.

ERRATUM

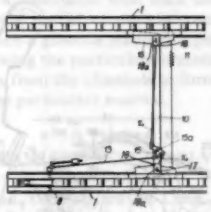
For Class 192—88 see:
Patent No. 3,777,868

3,777,867

ROLLER TRACKWAY CONSTRUCTION

Dierk Durwald, Weststr. 11, 5802 Wetter/Ruhr, Germany

Continuation of Ser. No. 11,543, Feb. 16, 1970, abandoned.
This application Jan. 10, 1972, Ser. No. 216,482
Claims priority, application Germany, Mar. 25, 1969, P 19 15 028.8
Int. Cl. B65g *13/00*
U.S. Cl. 193—35 A 8 Claims



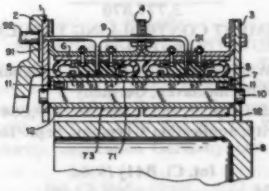
A roller conveyor or roller track includes a delivery end having a stop against which materials which are carried on a pallet are delivered. The delivery area includes control means in the form of a lever which is located adjacent the end stop in a position such that it is depressed by the material or its pallet when it arrives at the delivery point. The lever is connected to control means which is engageable with the next quantity of material or its pallet which is delivered toward the delivery point. The control means is effective to hold the next pallet at a spaced location from the pallet which has already arrived at the delivery point so that it will not interfere with this pallet when the latter is removed such as by a fork truck which is engageable therewith. As soon as the pallet is removed from the delivery point, the next pallet may move forwardly to the end position of the delivery area adjacent the stop in a position at which it may be engaged for removal without interference from the pallet which is next to the delivery area.

3,777,868

FLUID OPERATED COUPLING DEVICE

Eisuke Sugahara, Tokyo, Japan, assignor to Nippon Piston Ring Kabushiki Kaisha, Tokyo, Japan

Filed July 3, 1972, Ser. No. 268,518
Claims priority, application Japan, July 10, 1971, 46/60782
Int. Cl. F16d *25/04*
U.S. Cl. 192—88 B 6 Claims



An inner cylindrical face of a coupling member carries two axially juxtaposed circumferential rows of expansion cham-

bers, and a friction shoe is attached to each pair of respective expansion chambers of the two rows. When the expansion chambers are inflated by compressed air, the friction shoes are engaged with an outer cylindrical face of a second coupling member. The device may operate as a clutch or as a brake.

3,777,869

TYPE ACTION DRIVE

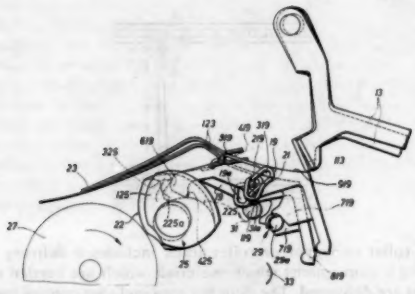
Albert Rix, Wilhelmshaven; Georg Werner, Heidmuhle, and Hans Fuchs, Wilhelmshaven, all of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany

Filed July 22, 1970, Ser. No. 62,781

Claims priority, application Germany, July 23, 1969, P 19 37 284.0. The portion of the term of this patent subsequent to Feb. 6, 1990, has been disclaimed.

Int. Cl. B41j *23/08*

U.S. Cl. 197—17 **10 Claims**



A type action has a driven lever carrying a rotary cam cooperating with the power roll. When a key lever is operated, it displaces a control lever so that the same is shifted from a rest position resiliently arrested by a tension spring, to an operative position in which the spring moves the control lever to turn the cam to a driven position engaged and rotated by the power roll so that the driven lever is operated. The turning cam also moves the control lever back toward the rest position so that the spring is again tensioned. When the cam separates from the power roll to permit inertia movement of the driven lever to obtain an impact by the type bar, the control lever, operated by the tension spring, turns the cam back to its initial position. Ball locking means cooperate with the control levers so that only one control lever at a time can be moved to the operative position while a control lever, later actuated by a key lever, abuts the locking balls and moves to the operative position when the first actuated control lever releases the locking means.

3,777,870

ESCAPEMENT CONTROLLING TABULATING APPARATUS

Dieter Drogi, Wilhelmshaven, Germany, assignor to Olympia Werke AG, Wilhelmshaven, Germany

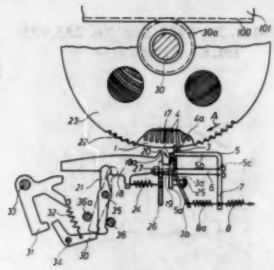
Filed Sept. 9, 1971, Ser. No. 179,064

Claims priority, application Germany, Sept. 16, 1970, P 20 45 638.6

Int. Cl. B41j *19/66*

U.S. Cl. 197—94 **10 Claims**

A tabulating apparatus has tabulator stop means and escapement stop means, operated by tabulator control means which place the tabulator stop means in the path of a set tab, whereupon the moving tab moves the tabulator stop means to release the escapement stop means so that it blocks carriage



movement before the tabulator stop means is released by the tabulator control means for biassed movement to an inoperative position releasing the set tab.

3,777,871

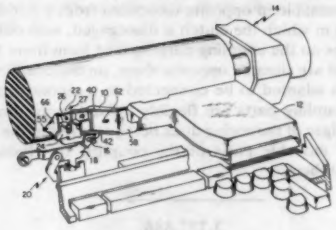
RIBBON GUIDE FOR TYPEWRITER RIBBON CARTRIDGE

Aaron C. Zeamer, Groton, N.Y., assignor to SCM Corporation, New York, N.Y.

Filed May 3, 1972, Ser. No. 249,954

Int. Cl. B41j *33/14*

U.S. Cl. 197—151 **13 Claims**



A ribbon guide or carrier arm for a typewriter ribbon cartridge is disclosed. The carrier arm which is pivotally connectable to the cartridge housing to laterally extend therefrom, has a pair of channels formed therein for guiding a ribbon from the housing to a print point and back to the housing. An aperture is provided adjacent the end of the arm for exposing a portion of the ribbon to the print point. The end of the arm is V-shaped to effect a reversal in the direction of movement of the ribbon. A step having channel means therein for the ribbon is provided at the opening to the V-shaped section. A transparent plastic sheet is secured over the channels in the carrier arm guiding the ribbon and a hollow V-shaped cap is secured over the end of the carrier arm thus shielding most of the ribbon along the carrier arm outside the housing.

3,777,872

DEVICE FOR THE TRANSPORTATION OF LOADS BETWEEN OPERATIONS

Mikhail Abramovich Rikman, ulitsa Molodogvardeiskaya, 24, korpus 1, kv. 51, and Felix Semenovich Ioffe, ulitsa Izumrudnaya, 6, kv. 72, both of Moscow, U.S.S.R.

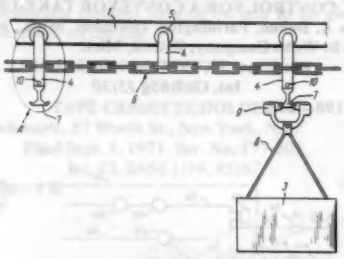
Continuation of Ser. No. 163,711, July 19, 1971. This application Dec. 11, 1972, Ser. No. 313,751

Int. Cl. B65g *17/20, 47/61*

U.S. Cl. 198—20 R **1 Claim**

The device of the present invention comprises overhead guide tracks along each of which carriages travel having hooks

secured to them through hinged joints for attaching a hanger with a load. Between said tracks there is arranged an overhead transfer conveyor whose trolleys are provided with forks that engage with the carriage when the hanger is being removed from or (attached to) the hook. The teeth of the fork are ar-



ranged at the level of the joint and have a height equal to the height of the upper part of the hook, which makes it possible to return the hook to its initial position to ensure reliable engagement should the hook deviate from its vertical position in the zone of engagement.

3,777,873

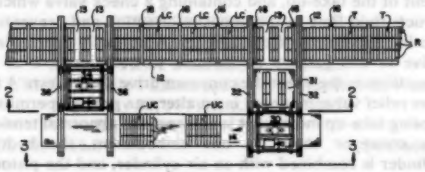
BRICK CONVEYOR

Gerald L. Stuart, Siler City, N.C., assignor to Forrest Paschal Machinery Company, Siler City, N.C.

Filed May 4, 1972, Ser. No. 250,151

Int. Cl. B65g *57/00, 59/00*

U.S. Cl. 198—35 **9 Claims**



Trays of brick, stacked two courses to a tray, one atop the other, are marshalled along a main index conveyor to a first transfer point, where a first transfer carriage removes the upper course from each tray, and transfers it to an auxiliary index conveyor synchronized with and driven in the same direction as the main conveyor. The bricks then proceed down parallel paths on the main and auxiliary conveyors in single layers facilitating grading and inspection, yet maintaining the economy realized from a multi-layered path. After inspection and grading a separator sheet is placed atop the lower course on the main conveyor, and, upon reaching a second transfer point, the upper course is returned to its original position atop one of the lower courses by means of a second transfer carriage. During the transfer, other operations may be performed, such as everting of the upper course and the forming of tyne courses in selected lower courses.

3,777,874

POWDER DEPOSITION SYSTEM

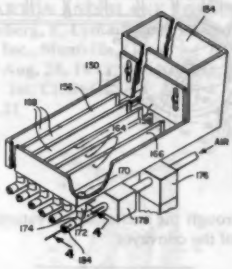
Lennox Birckhead, Trumbull, Conn., assignor to Air Products and Chemicals, Inc., Wayne, and Scott Paper Company, Delaware County, both of Pa.; part interest to each

Filed Dec. 22, 1971, Ser. No. 210,723

Int. Cl. B65g *47/18*

U.S. Cl. 198—56 **9 Claims**

A feeder for feeding particulate, thermoplastic material in a gaseous suspension to spray means. The feeder includes a hopper section at an upstream end thereof, and an elongate trough section extending downstream from the hopper section and separated from the hopper section by a gate. The trough section is subdivided into a plurality of channels by transversely spaced, elongate partitions. A delivery conduit is in separate communication with each of the channels, and a vacuum



creating means is associated with each delivery conduit for creating a region of partial vacuum in commmunication with each channel when a gaseous medium is passed therethrough for aiding in drawing the particulate material into each of the delivery conduits from the channels to form separate gaseous suspensions of the particulate maerial.

3,777,875

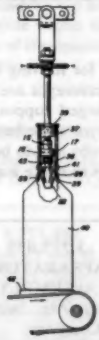
SUPPORT MEANS FOR RELEASABLY SUSPENDING CONTAINER

Michael J. Sobran, Old Greenwich, Conn., assignor to Glass Containers Corporation, Fullerton, Calif.

Filed Jan. 25, 1971, Ser. No. 109,170

Int. Cl. B65g *15/00*

U.S. Cl. 198—131 **8 Claims**



A hanger or support apparatus is disclosed for suspending a container by engagement with the interior wall of the opening portion of the container. Means are provided for quickly engaging and disengaging the hanger. The hanger is particularly adapted for suspending heated glass bottles for conveyance through an electrostatic coating apparatus.

3,777,876

SCRAPER FLIGHT CONVEYOR

Josef Schreier, Bochum, and Hugo Klimeck, Tonisheide, both of Germany, assignors to Gebr. Eickhoff, Maschinenfabrik Und Eisengiesserei m.b.H., Bochum, Germany

Filed Oct. 13, 1971, Ser. No. 188,795

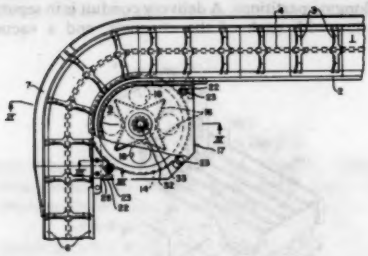
Claims priority, application Germany, Oct. 20, 1970, P 20 51 384.2

Int. Cl. B65g *19/08, 19/22*

U.S. Cl. 198—171 **6 Claims**

Improvements in scraper flight conveyors and more particularly an improvement in means for guiding a scraper flight

conveyor around a bend with the use of upper and lower guide wheels mounted for rotation about a vertical axis extending



substantially through the center of curvature of a circularly-curved section of the conveyor.

3,777,877

CONVEYOR ASSEMBLY

Robert J. Piper, Detroit, Mich., assignor to Stearns Manufacturing Co. Inc., Flat Rock, Mich.

Filed Oct. 12, 1972, Ser. No. 296,748
Int. Cl. B65g *17/06*
U.S. Cl. 198—189 **10 Claims**

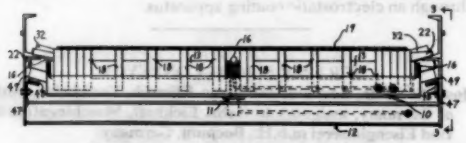
A conveyor assembly for moving baggage through a claim area. The pallets of the conveyor are hexagon-shaped and are pivotally mounted to hinged support members in a manner which permits the conveyor to be banked to provide access to the baggage carried thereby and to be formed to provide both inside and outside curves to make maximum use of the available claim area.

3,777,878

SELF-ALIGNING APPARATUS FOR IDLER ROLL ASSEMBLY

Thomas E. Morrison, Guin, Ala., assignor to Continental Conveyor and Equipment Company

Filed Dec. 11, 1972, Ser. No. 313,841
Int. Cl. B65g *15/62*
U.S. Cl. 198—202 **7 Claims**



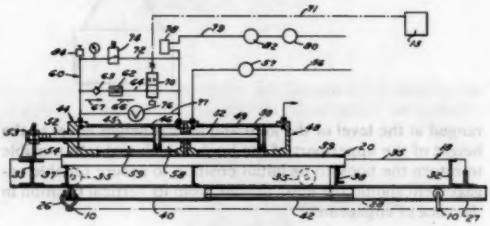
An actuating roll is carried by and mounted for rotation adjacent an end of a swivel mounted idler roll assembly with the upper surface thereof extending outwardly and upwardly to engage and support the adjacent edge of a belt upon lateral off center movement of the belt toward the roll. A brake subjacent the roll engages the under surface of the roll upon downward movement of the roll. The actuating roll is retained out of engagement with the brake until a predetermined force is exerted thereon by the belt.

3,777,879

CONTROL FOR A CONVEYOR TAKE-UP

Clarence A. Dehne, Farmington Township, Mich., assignor to Jervis B. Webb Company, Detroit, Mich.

Filed Nov. 30, 1971, Ser. No. 203,210
Int. Cl. B65g *15/30*
U.S. Cl. 198—208 **6 Claims**



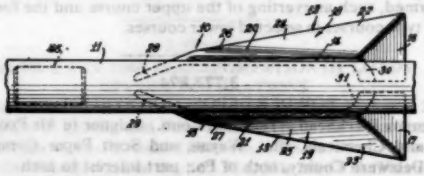
Relative movement between the fixed and movable frames of a conveyor take-up is controlled by a hydraulic cylinder and piston unit, the cylinder of which is connected to one of the frames and the piston to the other, the movable take-up frame being normally urged in an extending direction to apply tension to the conveyor chain. The hydraulic cylinder is connected to a fluid passage containing an orifice which permits fluid flow at a controlled rate in response to extending movement of the take-up, and containing a check valve which obstructs fluid flow in the opposite direction and prevents collapsing movement of the take-up. A normally open solenoid valve in this passage is operable to obstruct flow in both directions in the event the conveyor drive shuts down. A pressure relief valve mounted in an alternate passage permits collapsing take-up movement in the event of abnormal tension in the conveyor chain. In one embodiment, the hydraulic cylinder is combined with an air cylinder, and the pistons of both cylinders are mounted on a common rod, the air cylinder being supplied with regulated air pressure to apply a normal extending force to the movable take-up frame.

3,777,880

PLOW HARPOON-TYPE CONVEYOR

Roger T. Becker, Kalamazoo; Stephen L. Hatter, Portage, and Donald McMullin, Jr., Kalamazoo, all of Mich., assignors to Kalamazoo Conveyor Company, Kalamazoo, Mich.

Filed Apr. 13, 1972, Ser. No. 243,732
Int. Cl. B65g *25/08*
U.S. Cl. 198—221 **15 Claims**



An improved plow is provided for use in a harpoon-type or chip conveyor, the plow having a wide forward end and lateral walls. The lateral walls converge upwardly at the forward or leading portion of the plow and additionally converge rear-

wardly toward the trailing end. The plow is mounted below a supporting member in the form of a shaft or tube. In an improved embodiment the plow is made of two separate plow members mounted on the support in spaced-apart arrangement. Additionally, a longitudinal slot is provided in the lower wall of the tubular supporting member permitting the vertical flange of a T-shaped rail to be disposed in the slot and to permit the supporting member to slide on and to be guided by bearings mounted on the rail.

3,777,881

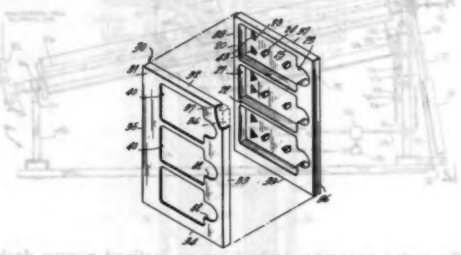
TAPE CASSETTE HOLDER

Louis E. Schwartz, 57 Worth St., New York, N.Y.

Filed Sept. 1, 1971, Ser. No. 177,001

Int. Cl. B65d *1/34, 85/67*

U.S. Cl. 206—1 R **7 Claims**



A container for a plurality of audio tape cassettes is disclosed in which a plurality of tape cassette receiving recesses together with resilient cassette retaining members are formed of one or two sheets of plastic material.

3,777,882

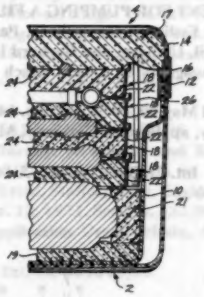
MULTI-TRAY INSTRUMENT CASE

David J. McIntyre, 3260 Lakewood Ave., South, Seattle, Wash.

Filed May 20, 1971, Ser. No. 145,417

Int. Cl. B65d *25/12, 85/54*

U.S. Cl. 206—16 S **18 Claims**



A multi-tray, protective storage and carrying case for delicate articles such as surgical instruments and the like. The case consists of a plurality of stackable instrument trays removably enclosed within a rigid, box-like case body. Each of the trays consists of a pad of elastically deformable plastic foam secured to and suspended within a peripheral frame. When stacked one on top of another within the case body, the top of one tray is situated in close proximity to the bottom of the overlying tray such that instruments resting on the first tray are cushioned from above and held in place by the foam pad in the overlying tray. Instruments in the uppermost tray of the stack are cushioned and held in place by a layer of elastically deformable plastic foam secured to the underside of the lid of the case. The trays can be removed from the case as a unit by means of handles secured to the rim of the lowermost tray.

3,777,883

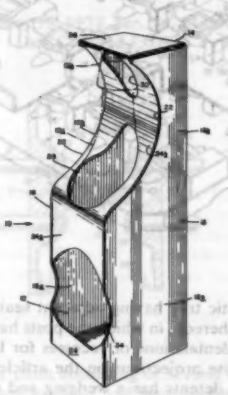
DISPLAY CARTON AND BLANK FORMING SAME

Robert A. Hackenberg, E. Lyme, Conn., assignor to Robertson Paper Box Co., Inc., Montville, Conn.

Filed Aug. 28, 1972, Ser. No. 284,256

Int. Cl. B65d *5/50, 25/02*

U.S. Cl. 206—45.31 **14 Claims**



A carton for displaying an article contained therein is formed from a single blank of material. It has integral panels forming the front, back and sides of the carton, at least one of which has a portion which is bowed inward toward the center of the carton. Openings near the top and bottom of the bowed panel portion allow an article within the carton to project out of the carton through one of the openings and reenter the carton through the other opening.

ERRATUM

For Class 206—56 see:
Patent No. 3,777,400

3,777,884

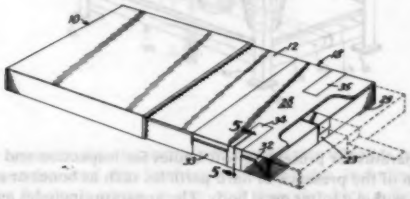
X-RAY FILM

Milton W. Hedin, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 97,731, Dec. 14, 1970, abandoned. This application Mar. 10, 1972, Ser. No. 233,502

Int. Cl. B65d *85/46, 85/48, 85/62*

U.S. Cl. 206—62 R **5 Claims**



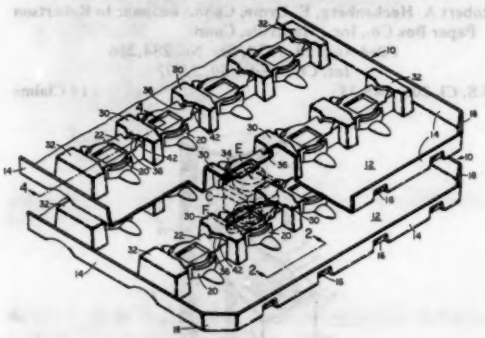
A package for X-ray film wherein the sheets of film are in faceTo-face contact and held in a compressed condition within the package to avoid shifting of the sheets during shipment and handling.

3,777,885

LOCKING MATERIAL-HANDLING TRAY

Werner W. Barteck, Lasalle, Mich., assignor to Rehkopf Industries, Inc., Toledo, Ohio

Filed Aug. 23, 1971, Ser. No. 173,990
Int. Cl. B65d *1/36, 71/00*
U.S. Cl. 206—72 9 Claims



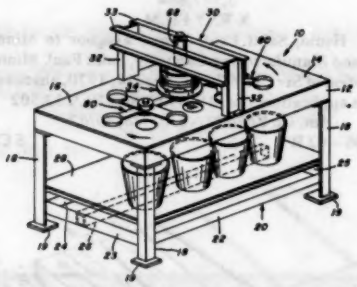
A molded plastic tray having adjacent seats and posts for locating articles thereon, in which the posts have complementary opposing indentalations or recesses for locking engagement with opposite projections on the articles. One of each pair of opposing detents has a wedging and stepped groove through which one of the article projections slides for mounting and removing the article from the tray. The trays are nestable when empty, and stackable when loaded with articles.

3,777,886

APPARATUS FOR INSPECTING BODIES FOR THE PRESENCE OF HARD PARTICLES

Richard A. Smith, Gibsonia, and Elmer E. Harris, Glenshaw, both of Pa., assignors to H. J. Heinz Company, Pittsburgh, Pa.

Filed Aug. 7, 1972, Ser. No. 278,543
Int. Cl. B07c
U.S. Cl. 209—109 17 Claims



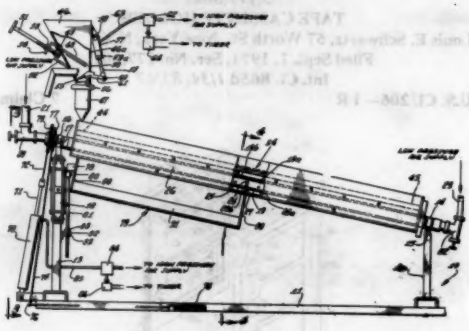
Apparatus for presenting soft bodies for inspection and detection of the presence of hard particles such as bones or cartilage, within a softer meat body. The apparatus includes automatic handling systems and control means for the handling systems whereby individual soft bodies are sequentially presented at a detection station and thereafter rejected for manual reinspection or advanced to the next food processing station. The control means provide sequence control for the various movable apparatus.

3,777,887

APPARATUS FOR SEPARATING DRY GRANULAR MATERIAL

Norris Johnston, and Mark Latker, both of Ojai, Calif., assignors to Albert M. Clark; John C. Manning, Bakersfield and John G. Troster, Atherton, Calif., part interest to each

Continuation-in-part of Ser. No. 863,989, Oct. 6, 1969, Pat. No. 3,667,601. This application May 27, 1971, Ser. No. 147,545
Int. Cl. B03b *3/04*
U.S. Cl. 209—474 4 Claims



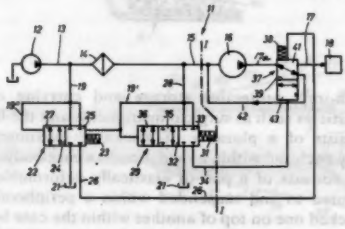
Separator apparatus embodying an inclined porous deck having parallel transverse upper grooves at right angles to its direction of inclination. Granular material deposited onto the upper end of the inclined deck is assisted by low pressure air forced upwardly through the deck in moving toward the lower end of the deck, the air effecting separation between granules or particles of greater specific gravity and granules or particles of lighter specific gravity, the former dropping to the bottom of the grooves while the latter float upwardly and flow progressively from groove to groove toward the lower end of the porous deck. The downstream sides of the grooves make an acute angle with the upper face of the inclined porous deck to entrain greater specific gravity particles in the grooves.

3,777,888

ARRANGEMENT FOR PUMPING A FILTERED FLUID

Gustav Zellbeck, Esslingen-Hegensberg; Paul Bosch, Ludwigsburg; Karl Veil, Uhingen, and Gerhard Lutz, Faurndau, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed May 20, 1971, Ser. No. 145,301
Claims priority, application Germany, May 21, 1970, P 20 24 675.7
Int. Cl. B01d *29/36, 35/14*
U.S. Cl. 210—130 18 Claims



A feed pump supplies a fluid through a filter to a main pump which pumps the fluid in filtered condition to a consumer.

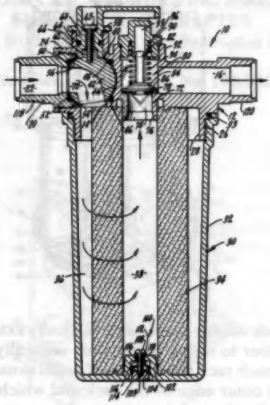
When the filter becomes clogged, a valve responsive to the increased pressure differential upstream and downstream of the clogged filter, supplies fluid for operating either a control valve connecting the outlet and inlet of the main pump and causing idle circulation of the fluid, or a hydraulic regulating means for setting the main pump to a minimum discharge.

3,777,889

CARTRIDGE FILTER UNIT

Robert A. Henderson, Rosemount, Minn., assignor to Ecodyne Corporation, Chicago, Ill.

Filed Apr. 5, 1972, Ser. No. 241,179
Int. Cl. B01d *35/14, 27/10*
U.S. Cl. 210—135 **10 Claims**



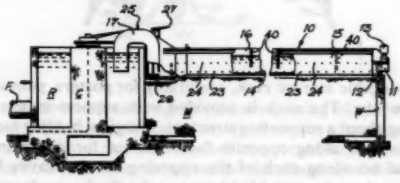
A self contained filter unit comprising a head having diametrically opposed horizontal inlet and outlet passages separated by a partition wall, a filter cartridge removably attached to the head for communicating the inlet passage with the outlet passage, a ball valve member having an elbow-shape flow passage formed therein mounted within the inlet passage effective to selectively direct fluid passing therethrough into the filter cartridge, and a check valve member mounted within the outlet passage effective to permit fluid flow from the filter cartridge to the outlet passage and prevent fluid flow from the outlet passage to the filter cartridge. The ball valve member is provided with an O-ring sealing assembly which prevents the upstream O-ring from blowing out at high pressures.

3,777,890

ROTARY DISTRIBUTORS

Michael Augustine Hartley, Newcastle, and Robert Rowley, Congleton, both of England, assignors to Simon-Hartley Limited, Stoke-on-Trent, Staffordshire, England

Filed Apr. 12, 1971, Ser. No. 132,963
Claims priority, application Great Britain, Apr. 24, 1970, 19,944/70
Int. Cl. B01d *23/20*
U.S. Cl. 210—150 **21 Claims**



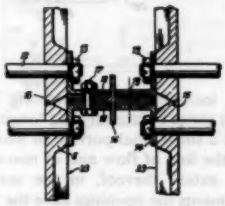
A rotary distributor of the kind comprising a rotatable structure having at least one radially extending distributor arm which serves to distribute an effluent liquid onto the bed of a percolating or biological filter, characterised in that the or each distributor arm is in the form of a channel having orifices in one or both side walls thereof, said orifices being disposed at different heights whereby the number of orifices able to discharge effluent at any time is dependent upon the level of effluent in the channel and hence the rate of flow of effluent being distributed.

3,777,891

TRICKLING FILTER PLANT

Johann Conrad Stengelin, Obere Vorstadt 21, Tuttlingen, Germany

Filed May 18, 1971, Ser. No. 144,615
Int. Cl. B01d *33/28*
U.S. Cl. 210—150 **21 Claims**



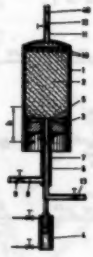
A trickling filter plant consisting of several circular plates immersed into a tank to about half their diametric height and mounted on a drive shaft; the individual plate is thereby composed of several sectors fastened to radial struts secured to the drive shaft and combined into stacks by bolts extending through reinforced spacer cams provided on the sectors.

3,777,892

APPARATUS FOR THE SEPARATION AND TREATMENT OF SOLID PARTICLES FROM A LIQUID SUSPENSION

Henricus A. C. Thijssen et al., 2 Rontgenlaan, Son, Netherlands

Filed June 25, 1971, Ser. No. 156,717
Claims priority, application Great Britain, Jan. 27, 1971, 3,331/71
Int. Cl. B01d *29/00*
U.S. Cl. 210—178 **18 Claims**



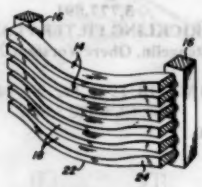
An apparatus for separation and purification of solids from a suspension and for leaching solid particles including a column having a piston at one end through which a liquid suspension of solid particles is suppled and through which the suspension liquid is removed. The piston is reciprocated to form a bed of solid particles; at the other end of the column the particles are progressively removed after being treated by melting or by mechanical scrapers with wash liquid being passed through the bed for cleaning or leaching purposes.

3,777,893

CLASSIFYING AND SCREENING APPARATUS

Marvin E. Ginaven, Springfield, Ohio, assignor to The Bauer Bros. Co., Springfield, Ohio

Filed June 28, 1971, Ser. No. 157,254
Int. Cl. B01d 39/10
U.S. Cl. 210—499 10 Claims



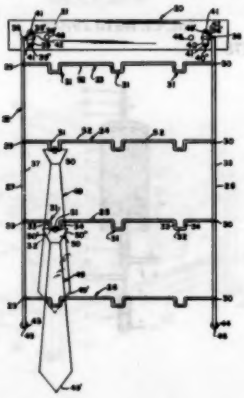
A screen unit including means defining a flow surface characterized by a series of laterally and longitudinally spaced openings, at least a substantial portion of which are laterally extended across the line of flow and of non-uniform dimension, the lateral extent thereof, in the sense of flow. In preferred embodiments the openings have the form of tapered slots defined by wave-line bars or curved wires of non-uniform thickness.

3,777,894

TIE RACK DEVICE

Robert W. Swenson, 515 Detroit Lake, Detroit Lakes, Minn.

Continuation-in-part of Ser. No. 49,765, June 25, 1970, abandoned. This application Nov. 10, 1971, Ser. No. 197,544
Int. Cl. A47f 7/12
U.S. Cl. 211—13 2 Claims



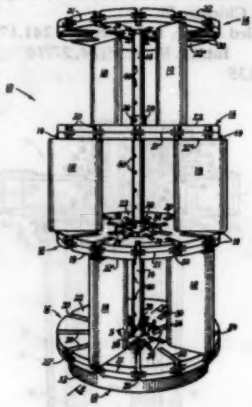
The invention comprises a clip on tie rack having a panel adapted to be attached to a wall and a wire rod ladder like framework attached to the panel. The framework is formed of a pair of vertical rod members and a plurality of horizontal rod members extending across from one vertical rod member to the other and attached thereto. Each horizontal rod member has a plurality of rectangular notches for attachment of the hook of a clip on tie.

3,777,895

DISPLAY STAND FOR YARD GOODS

Frank Weinstein, New York; George Mileos, Jackson Heights, both of N.Y., and Alan W. Anderson, Rowayton, Conn., assignors to Concord Fabrics, Inc., New York, N.Y.

Filed Apr. 23, 1971, Ser. No. 136,729
Int. Cl. A47f 7/18
U.S. Cl. 211—44 15 Claims



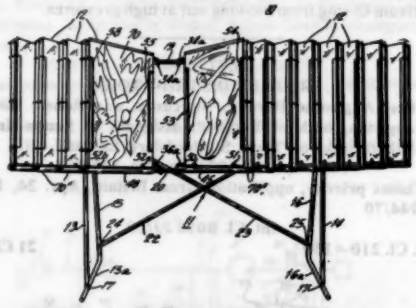
A yard goods display stand has a vertically extending central support member to which at least two vertically spaced racks are secured; each rack has a series of radial slots therein which extend to the outer edge of the rack and which are vertically aligned with the slots of the other rack to permit insertion of the ends of fabric bolts in opposed slots for support on the stand.

3,777,896

COMBINED DISPLAY AND STORAGE RACK

Mary Roberta Ehrlich, 425 E. 52nd St., New York, N.Y.

Filed Aug. 12, 1971, Ser. No. 171,279
Int. Cl. A47f 1/00
U.S. Cl. 211—49 D 9 Claims



A swingable storage rack, preferably for posters, paintings, and the like. The rack is provided with support means for pivoting about a supporting structure. Marginal holding means are provided along opposite faces thereof for displaying a work of art along each of the opposing faces. Gravity-feed storage means are provided between the display surfaces for holding and storing a plurality of copies of the works of art being displayed, which are maintained within the storage portion in tubular form. Dispensing means are provided at the

bottom end thereof whereby the lowermost copy may be removed, causing the remaining copies to feed downwardly by gravity. The copy to be dispensed is lifted outwardly in a direction transverse to the plane of the work of art being displayed. Alternatively, the bottom most copy of the work of art being displayed may be drawn outwardly therefrom along a line substantially parallel to the plane of the work of art being displayed.

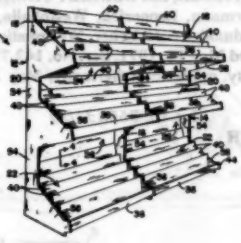
A plurality of such combined display-storage racks may be pivotally mounted upon a suitable support, whereby all such racks are swingable so as to facilitate observation of each of the works of art being displayed.

3,777,897

CONTINUOUS CASCADE SHELVING ASSEMBLY OF KNOCKDOWN CHARACTER

John F. Gray, Rt. 1, Box 233 N. Old Barrington Rd., Barrington, Ill.

Filed Oct. 18, 1971, Ser. No. 190,060
Int. Cl. A47f *7/00*
U.S. Cl. 211—55 **2 Claims**



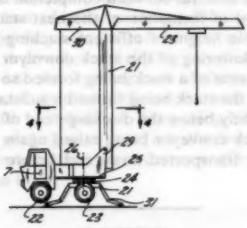
Continuous knockdown cascade shelving including preassembled cascade units arranged in tiers and supported by medial and end supports.

3,777,898

TRACTION AND STEERING DEVICE

Maurice Gallay, 151 Blvd. de Chinon, Joue Les Tours, France

Filed Oct. 8, 1971, Ser. No. 186,386
Claims priority, application Great Britain, Oct. 5, 1970, 35,916/70
Int. Cl. B66c *23/36*
U.S. Cl. 212—38 **5 Claims**



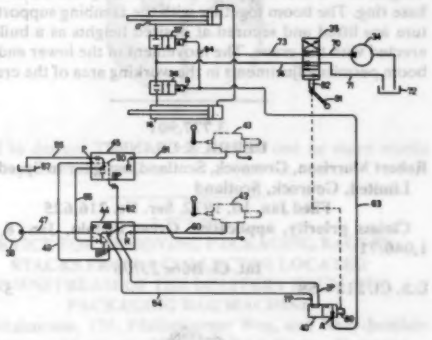
A traction and steering device comprising of a chassis, a rotatable platform pivotably mounted on the chassis, a front axle and a drive and steering unit connected to the rotatable platform, a rear axle connected to the chassis and lowerable stabilizing arms which are connected to the chassis and operate to lift the device above the ground. The front axle is used to drive and steer the vehicle whereas the rear axle is used merely as a load bearing axle.

3,777,899

BOUNCE-PREVENTING CONTROL FOR HYDRAULIC CYLINDER

Wallace J. Witwer, Cedar Rapids, Iowa, assignor to Harnischfeger Corporation, Milwaukee, Wis.

Filed Aug. 14, 1972, Ser. No. 280,482
Int. Cl. F15b *11/08; B65c 23/06*
U.S. Cl. 212—55 **4 Claims**



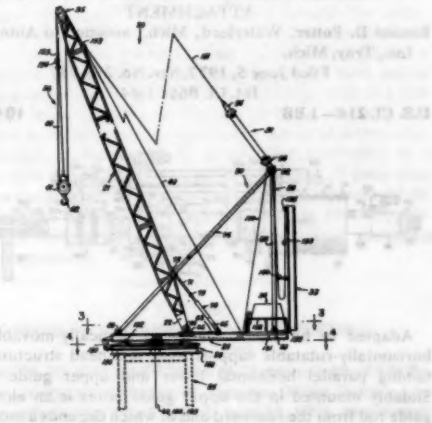
A crane boom is raised and lowered by the extendable and retractable cylinder rod of a hydraulic boom hoist cylinder. A main pump supplies pressurized operating fluid to the cylinder through a lever controlled manually operable three-position (raise, lower, neutral) main control valve. A pilot valve operating holding valve on the cylinder maintains the rod in extended position. To prevent bounce and fluctuation as the cylinder rod is retracted and the boom is lowered, the pilot valve is supplied with pilot fluid from a fluid source other than the cylinder or main pump and is operated by the same lever that operates the main control valve.

3,777,900

BUILDING CRANE

Jack J. Brewer, Graham, Tex., assignor to Sam Po Wallace Co., Inc., Dallas, Tex.

Filed Dec. 20, 1971, Ser. No. 209,583
Int. Cl. B66c *23/08*
U.S. Cl. 212—58 R **14 Claims**



A crane for construction of buildings and the like including a climbing support structure adapted to be raised as the build-

ing is constructed, a carrier ring on the climbing support structure for rotatably mounting the crane, a boom base platform rotatably mounted on the ring for supporting the base end of a boom, a boom mounted at a base end for movement across a diameter of the ring and rotation with the boom platform, a gantry assembly, a boom topping bridle between the free end of the boom and the gantry assembly for boom support and manipulation, an extension platform for supporting a counterweight, and a drive apparatus for rotating the boom on the base ring. The boom together with the climbing support structure are lifted and secured at desired heights as a building is erected with the crane. The movement of the lower end of the boom permits adjustments in the working area of the crane.

3,777,901

DERRICK CRANES

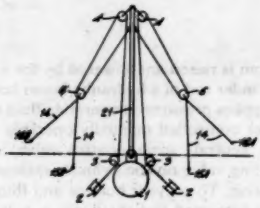
Robert Morrison, Greenock, Scotland, assignor to Speedcranes Limited, Gourock, Scotland

Filed Jan. 10, 1972, Ser. No. 216,625

Claims priority, application Great Britain, Jan. 8, 1971, 1,040/71

Int. Cl. B66c *23/06*

U.S. Cl. 212—58 **5 Claims**



A derrick crane in which the rigging is secured by at least two pendant members to the deck or base member at determined positions transversely of the central position of the jib and is connected to pulley members interposed in the rigging of the crane and thereby to the head of the jib and to the head of the mast, operation of the winches in the same direction effecting a topping or lowering of the jib and operation of the winches in opposite directions effecting a slewing of the jib.

3,777,902

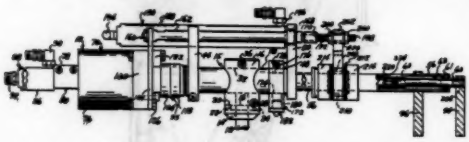
WORKPIECE-GRIPPING REACH AND TURNOVER ATTACHMENT

Ronald D. Potter, Waterford, Mich., assignor to Auto-Place, Inc., Troy, Mich.

Filed June 5, 1972, Ser. No. 259,757

Int. Cl. B66c *1/44*

U.S. Cl. 214—1 BB **10 Claims**



Adapted to be mounted upon a vertically-movable and horizontally-rotatable support shaft is a head structure containing parallel horizontal lower and upper guide bores. Slidably mounted in the upper guide bores is an elongated guide rod from the rearward end of which depends a mounting plate carrying a fluid-operated rotary actuator with a hollow output shaft having a circumferentially-adjustable drive connection with an elongated hollow arm shaft slidably mounted in the lower guide bore and having a fixed workpiece-gripping jaw secured to its outer end.

Mounted on the rearward end of the rotary actuator is a lower fluid-operated reciprocatory jaw-actuating motor, the lower piston rod of which is drivingly connected to a jaw-operating rod extending forward through the hollow output and hollow arm shaft to a movable workpiece-gripping jaw mounted thereon adacent the fixed workpiece-gripping jaw. Also mounted on the head structure is an upper fluid-operated reciprocatory reach motor, the upper piston rod of which is disposed parallel to the lower piston rod. Depending from the forward end of the upper piston rod is the upper end of a drag link, the lower end of which is operatively connected to the shaft arm to reciprocate the shaft arm while permitting relative rotation therebetween.

In operation the reach motor moves the hollow shaft arm back and forth by means of the drag link, the rotary actuator rotates the shaft arm and workpiece-gripping jaws through a predetermined angle, and the jaw-operating motor moves the movable jaw toward and away from the fixed jaw to grip or release the workpiece respectively.

3,777,903

APPARATUS FOR FORMING AND CONVEYING STACKS OF FLAT ARTICLES, ESPECIALLY SHEET ARTICLES

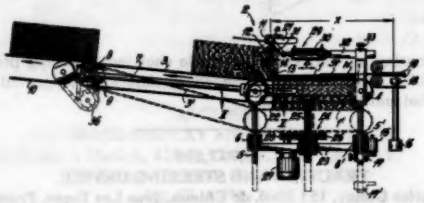
Gustav Kuckhermann, Lengerich, Westphalia, Germany, assignor to Windmoller & Holscher, Westphalia, Germany

Filed May 12, 1971, Ser. No. 142,730

Claims priority, application Germany, May 19, 1970, P 20 24 398.5

Int. Cl. B65h *31/30*

U.S. Cl. 214—6 H **5 Claims**



In apparatus for forming and conveying stacks of sheet articles arriving on a supply conveyor, the apparatus comprising a stack conveyor on which the articles are successively deposited in superposed relationship aligned against a displaceable abutment whilst the stack conveyor is not feeding and by which each completed stack is fed to a discharge conveyor, the time interval between completion of one stack and commencement of formation of the next stack is minimised and the possible height of efficient stacking is increased by providing for lowering of the stack conveyor in dependence on the growth rate of a stack being formed so that the uppermost article in the stack being formed is substantially at a constant level slightly below the discharge end of the supply conveyor, the stack conveyor being raised again as a completed stack is being transported away and before a new stack is formed.

3,777,904

DAMPENING SYSTEM FOR THE TRANSFER TABLE OF A BALE WAGON

Gene R. Butler; Lee D. Butler, and Robert A. Gibson, all of Kingsburg, Calif., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Sept. 14, 1971, Ser. No. 180,370

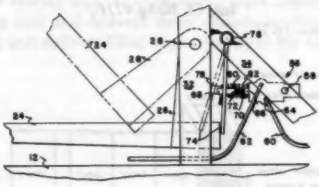
Int. Cl. B65g *57/28*

U.S. Cl. 214—6 B **1 Claim**

A dampening system for the transfer table of a bale wagon having a receiving table, transfer table and load bed arranged

in tandem. The transfer table is pivotally mounted intermediately between the receiving table and load bed and is powered up from a normal horizontal tier forming position to a vertical position, where the tier is deposited on the load bed, by a remotely controlled single acting hydraulic cylinder, the hydraulic cylinder being actuated by a control valve. From the vertical position, the transfer table is allowed to free fall to the normal horizontal position. Although several embodiments for dampening the impact of the transfer table are shown, common to all is the provision of a flow restricting device and a control responsive to the movement of said transfer table for directing fluid from said cylinder through a flow restricting device during a selected interval of the transfer table's free fall.

To dampen the impact of the free falling transfer table, one embodiment of the present invention, comprises a selector valve and associated flow restrictor interposed between said single acting cylinder and the control valve. The selector valve is mechanically controlled by a lever arm operatively connected thereto and pivotally mounted behind the transfer table for selective engagement therewith such that during the latter stages of free fall, fluid is directed through the restrictor, thereby reducing the velocity of the free falling table and dampening its impact.



A second type of embodiment utilizes a flow restricting device in a line extending from the anchor end of said single acting cylinder and further provides an unrestricted exit line leading from a side port in said cylinder, said side port being particularly spaced from the anchor end to allow fluid to exit therethrough as the transfer table free falls from its vertical position to a point just above the normal horizontal position, at which point the piston of said cylinder has moved past said side port towards the anchor end of said cylinder and the remaining fluid in said cylinder must necessarily exit through the line having the flow restricting device therein. Thus, decreasing the velocity of the piston and transfer table which results in a chusioned impact when the transfer table reaches its normal horizontal position.

A final type of embodiment for a dampening system for the transfer table comprises a single acting cylinder having an elongated bore formed in the anchor end thereof, the bore extending to and joining a single port formed at the anchor end of the cylinder. A dowel pin of slightly less diameter than said bore is mounted to the working face of the cylinder's piston and extends therefrom toward the anchor end of the cylinder in alignment with said bore. A dampening effect is realized once the dowel pin begins to move into the bore, as the flow of exiting fluid is restricted by the decrease in effective cross sectional area of the bore.

3,777,905

PILE OF COILS COMBINED TO A HANDLEABLE UNIT

Edward O. Morris, Rome, Ga., assignor to N.V. Bekaert S.A., Zwevegem, Belgium

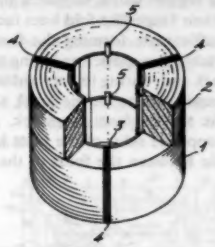
Filed Aug. 27, 1971, Ser. No. 175,541

Claims priority, application Netherlands, Sept. 1, 1970, 7012906

Int. Cl. B65g *1/14*

U.S. Cl. 214—10.5 R **1 Claim**

A pile of coils combined into a handleable unit includes a plurality of coils each having a rigid core or a rigid casing which are linked together by a plurality of connecting elements. The connecting elements may be U-shaped or H-



shaped in design. The pile may include one or more stacks and/or layers of wire coils.

3,777,906

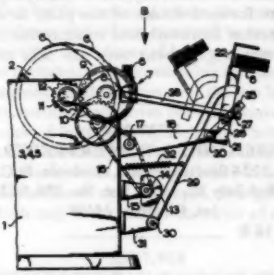
DEVICE FOR REMOVING PACKAGING BAGS IN STACKS FROM A COLLECTOR LOCATED DOWNSTREAM OF THE DELIVERY DRUM OF A PACKAGING BAG MACHINE

Hans Stolzmann, 176, Pfaffenberger Weg, and Hans-Joachim Stolzmann, 14, Kempen, both of 565 Solingen, Germany

Filed May 25, 1972, Ser. No. 256,858

Int. Cl. B31b *1/98*

U.S. Cl. 214—1 BD **1 Claim**



A device for removing packaging bags in stacks from a collector located downstream of the delivery drum of a packaging bag machine, wherein a U-shaped gripper, the free ends of the legs of which are bent in the direction towards the collector, co-operates with a collector arranged downstream of the delivery drum of the packaging bag machine. The gripper is displaceably guided by its legs owing to tension from helical springs acting on its web within one of the end walls of a substantially frame-shaped arm capable of being rotatably displaced in a vertical plane by means of a driven eccentric disc. The gripper is displaceable by a lever arm controlled by a driven cam with a view to clamping the stack of packaging bags on the gripper between the bent legs of the latter and the frame-shaped arm which is capable of being rotatably displaced or with a view to releasing the stack of packaging bags, respectively.

3,777,907

METHOD AND APPARATUS FOR FEEDING NEWSPAPERS

Warren W. Hannon, and Charles N. Hannon, both of Olathe, Kans., assignors to Warren W. Hannon, Olathe, Kans.

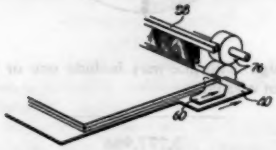
Continuation of Ser. No. 136,090, April 21, 1971, abandoned. This application Mar. 5, 1973, Ser. No. 338,382

Int. Cl. B65h *3/22, 3/26*

U.S. Cl. 214—8.5 F **6 Claims**

Feeder apparatus for folded newspaper sections which has particular utility in the case of a relatively thin outer section

which receives a number of stacked inserts causing the total supplemented section to be of substantial thickness. The apparatus includes a hopper which supports an upright stack of the sections with their hinge-like fold lines facing the direction of delivery. A shuffle plate forming the floor of the hopper along with retractable newspaper engaging pins reciprocates laterally of the stack and, during its forward stroke, carries the lowermost newspaper section in the stack therewith to partially withdraw the section from the stack. A pair of blades reciprocating on opposite sides of the plate in timed relationship therewith, slip between the folds of the section and engage the fold line of the section after slight initial movement of the lower half of the newspaper jacket section by the plate and pin structure. Continued movement of the blades at a faster rate than the plate causes the section to be moved relative to the plate and effect introduction thereof by the blades between feed rollers which complete the withdrawal of the section from the stack. The retractable pin structure on the plate engages the lowermost supplemented newspaper section only during the forward stroke of the plate to assure movement of the section therewith and retracts during the return stroke to prevent engagement with the next section in the stack.



3,777,908

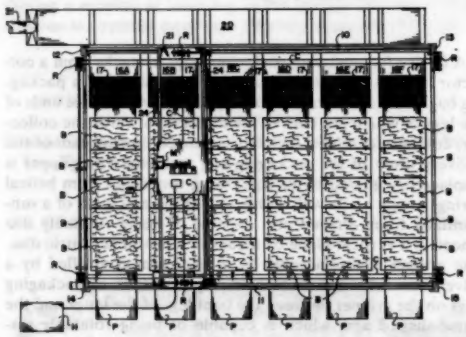
MECHANICAL HOPPER FEEDER

Alex J. Keller, 2224 Scottwood Dr., Gastonia, N.C.

Filed July 28, 1972, Ser. No. 275,942

Int. Cl. D01g *13/00*

U.S. Cl. 214—16 R **4 Claims**



The invention relates to an apparatus for mechanically loading fibers into the hoppers of fiber feeders.

3,777,909

APPARATUS FOR LOADING HOTMIX IN A SURGE BIN

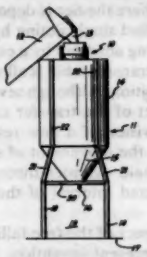
Lamson Rheinfrank, Jr., Kansas City, Mo., assignor to Standard Havens Systems Inc., Glasgow, Mo.

Filed Mar. 11, 1970, Ser. No. 18,651

Int. Cl. B65g *65/32*

U.S. Cl. 214—17 C **1 Claim**

Hotmix is continuously delivered by conveyor to the top of a surge bin, and is intermittently held back from dropping into the bin by a pulse feeder which continuously receives the hotmix and pulsingly discharges the hotmix to the surge bin. The feeder includes an open topped container with a central discharge opening which is intermittently opened and closed by pneumatically activated clam gates.



3,777,910

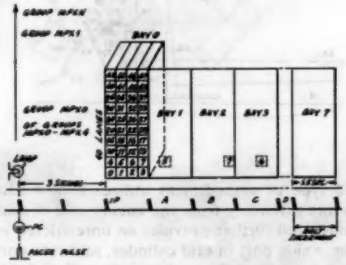
TAPE CONTROLLED ORDER PICKING SYSTEM

Dale A. Baker, and John M. McCarthy, both of Milwaukee, Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Nov. 5, 1971, Ser. No. 195,930

Int. Cl. B65g *47/10*

U.S. Cl. 214—16 B **15 Claims**



A punched paper tape controlled electrical control system for operating solenoids to release articles from gravity storage lanes in a warehouse onto a conveyor by which they are conveyed to an output station. The tape controls release of the articles so that they will exit the storage racks, one article per conveyor increment, in a predetermined order. The tape contains drop data for controlling dropping of articles from storage lanes, and shortage data for controlling a printer to print the bay, lane and serial number of an article if a photocell detector fails to detect exit thereof. The tape also contains control data for controlling purge of an order, that is, completion of an order without starting the partially overlapping next order punched on the tape. The tape further contains other control data for operation of the system. The system operation is synchronized by means of a rotary cam switch preferably driven by the conveyor to control the time of dropping of articles and checking for shortage at the photocell detector.

3,777,911

APPARATUS FOR MANIPULATING CONTAINERS FOR CIGARETTES OR THE LIKE

Ulrich Bornfleth, Hamburg, Germany, assignor to Hauni-Werke Korber & Co. KG, Hamburg-Bergedorf, Germany

Continuation of Ser. No. 878,674, Nov. 29, 1969, abandoned. This application Mar. 6, 1972, Ser. No. 232,223

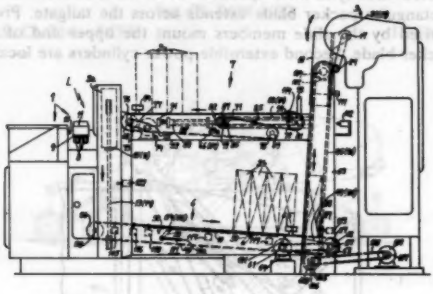
Claims priority, application Great Britain, Nov. 25, 1968, 55,852/68

Int. Cl. B65g *47/69*

U.S. Cl. 214—16.4 C **11 Claims**

Apparatus for transporting trays between the tray filling unit of a cigarette making machine and an evacuating unit

which dumps the contents of filled trays into the magazine of a cigarette packing machine comprises a pair of superimposed storing units and an intermediate conveyor which transports filled trays from the lower storing unit to the evacuating unit.



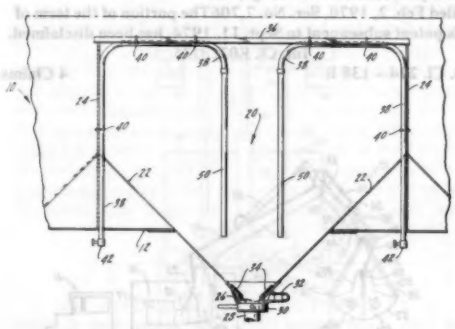
The upper storing unit receives empty trays directly from the evacuating unit and delivers them directly to the filling unit. The filling unit delivers filled trays directly to the lower storing unit.

3,777,912

PRESSURE FLOW DISCHARGE MECHANISM

Ronald G. Deeks, 1521 Warland Rd., Oakville, Ontario, Canada

Continuation of Ser. No. 21,573, March 23, 1970, abandoned. This application Jan. 12, 1972, Ser. No. 217,387
Int. Cl. B65g 67/24
U.S. Cl. 214—152 1 Claim



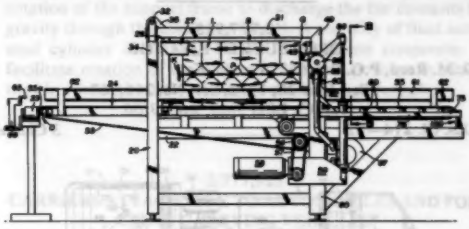
An improved method of and means for effecting the discharge of commodities from hopper-type railroad tank cars. The hopper includes a discharge port, for removing the material, having a gas inlet positioned adjacent thereto. Rubber hoses are suspended over each hopper symmetrically about the transverse centerline and on the longitudinal centerline. The top ends of these hoses are fixed to air supply pipes and a structural support also holds the top rigid while the bottom ends of the hoses are free to whip. Air is passed through the rubber hose to effect a mechanical whipping action which knocks compacted material down into the hopper bottom.

3,777,913

MACHINE FOR REMOVAL OF BOTTLES FROM SHIPPER BAGS AND PLACEMENT THEREOF ON A CONVEYOR

Warren J. Schieser, Columbus, and Stanley E. Vickers, Hideaway Hills, both of Ohio, assignors to Cerco, Inc., Worthington, Ohio

Filed July 28, 1972, Ser. No. 276,098
Int. Cl. B65g 59/04
U.S. Cl. 214—8.5 D 16 Claims



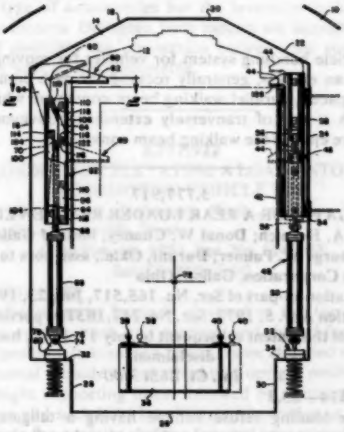
A machine which receives a bag of double-stacked bottles and automatically unloads the bottles from the bag, after one end is opened, and places them on an unloader conveyor in a single layer. The bottles, for example, may be large single-service plastic bottles and the bag may be of flexible plastic film. The machine includes a transfer hopper in which the bag of double-stacked bottles is placed where the open-ended bag is stripped therefrom, and which is moved to an unstacking station to position the lower layer of bottles on the unloader conveyor. It also includes, at the unstacking station, a vacuum-lift rack which automatically rotates over the top layer of bottles, grips them by vacuum and moves over the conveyor to deposit the upper layer of bottles upright thereon behind the previously positioned lower layer. The bottles thus positioned on the unloader conveyor in the single layer may then be positioned, by movement of that conveyer, in single file on a feed conveyor which may be the loader conveyer of a bottle filler.

3,777,914

RETRACTABLE RAILROAD CAR CLAMP

Edward E. Cheek, Cleveland, and Raymond H. Sabin, Willoughby Hills, both of Ohio, assignors to McDowell-Wellman Engineering Company, Cleveland, Ohio

Filed Apr. 6, 1972, Ser. No. 241,652
Int. Cl. B65g 67/54
U.S. Cl. 214—55 7 Claims



There is provided a clamping apparatus for clamping railroad cars into a rotary dumper capable of inverting cars to

discharge the contents. The clamp is characterized in having a jaw member pivotally mounted on one end of an extensible arm. Stationary guide means are provided for coaction with the jaw to guide it along a predetermined path. Means are also provided coacting between the support and the jaw member for tilting the jaw member so that it clears the maximum composite envelope of locomotive profiles within the opening provided in the adjacent end ring of the rotary railroad car dumper.

3,777,915

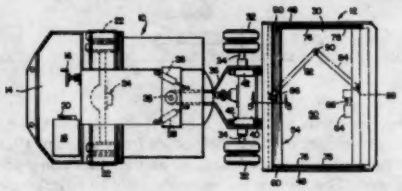
OPEN BUCKET EJECTOR

D. M. Reed, P.O. Box 652, Martin, Ky.

Filed June 28, 1972, Ser. No. 266,967

Int. Cl. E02f *3/00*; B65f *3/00*

U.S. Cl. 214—82 **3 Claims**



An open bucket ejector mechanism operated by a rack and pinion utilizing an accordion type arm structure which serves to protect hoses for a hydraulic actuating mechanism, the accordion protector serving additionally as a hose retractor.

3,777,916

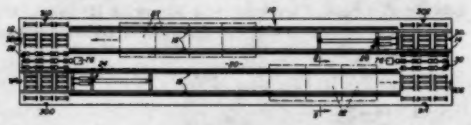
ARTICLE HANDLING SYSTEM

David E. Lutz, 330 Washington Ln., Carlisle, Pa.

Filed Nov. 24, 1971, Ser. No. 201,807

Int. Cl. B60p *1/52*, *1/00*

U.S. Cl. 214—519 **11 Claims**



An article handling system for vehicles for moving articles through an endless, generally rectangular path comprising a pair of spaced, parallel walking beam conveyors which intersect with a pair of tranversely extending conveyors at the respective ends of the walking beam conveyors.

3,777,917

TAILGATE FOR A REAR LOADER REFUSE VEHICLE

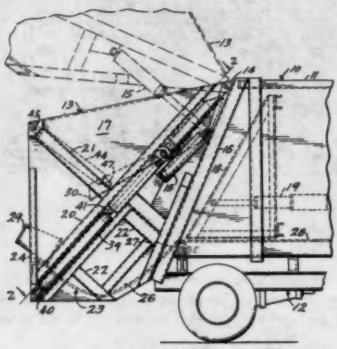
William A. Herpich; Donal W. Chaney, both of Galion, Ohio, and George W. Palmer, Durant, Okla., assignors to Peabody Galion Corporation, Galion, Ohio

Continuation-in-part of Ser. No. 165,517, July 23, 1971. This application Apr. 5, 1972, Ser. No. 241,183The portion of the term of this patent subsequent to July 17, 1990, has been disclaimed.

Int. Cl. B65f *3/00*

U.S. Cl. 214—83.3 **5 Claims**

A rear loading refuse vehicle having a tailgate that is pivotally mounted at its upper forward end to the rear of the vehicle body. The tailgate has a hopper-like bottom into which refuse is dumped. Straight, upwardly inclined, parallel guide tracks are provided, one in each of the sidewalls of the tailgate and a slide member is reciprocable in each guide track. Each of a first pair of lineally extensible power cylinders is mounted at its lower end on the outer side of the sidewall and extends upwardly and forwardly in alignment with the respective guide track, the upper end of the rod of the cylinder being connected directly to the respective one of the slide members. A rectangular packer blade extends across the tailgate. Pivots carried by the slide members mount the upper end of the packer blade. Second extensible power cylinders are located



interiorly of the tailgate at the inner sides of the side walls, the upper ends thereof being pivotally mounted at the upper rear corners of the tailgate and the lower ends thereof being pivotally connected to the sides of the packer blade intermediate its ends. A sliding fall-back shield is attached to the slide members and extends across between the side walls of the tailgate above the upper end of the packer blade where it overlaps a stationary fall-back shield which closes off the upper forward portion of the tailgate.

3,777,918

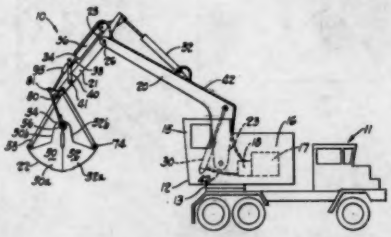
MATERIAL HANDLING IMPLEMENT

Claude L. Barber, Baker, La., assignor to Yaun Manufacturing Company, Inc., Baton Rouge, La.

Filed Feb. 2, 1970, Ser. No. 7,706The portion of the term of this patent subsequent to Sept. 11, 1974, has been disclaimed.

Int. Cl. E02f *3/75*

U.S. Cl. 214—138 R **4 Claims**



A clam shell material handling implement which is connectable to a back hoe type material handling apparatus is disclosed. The clam shell implement includes hinged jaws each connected to the back hoe dipstick by articulating linkages. The back hoe bucket ram is connected to the jaw hinge by a cable so that the jaws are opened and closed by operation of the bucket ram. The linkages carry a cable guiding sheave construction. The implement is connectable as a unit to the dipstick without modification of the back hoe machine.

3,777,919

MOBILE EXCAVATOR

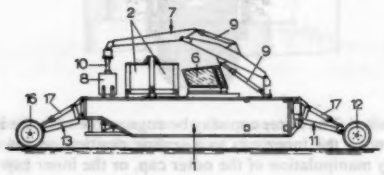
Nicolaas Gerardus Konijn, Berkhout, Netherlands, assignor to Konijn Machinebouw, Hoorn, Netherlands

Filed Apr. 13, 1972, Ser. No. 243,699

Claims priority, application Netherlands, Apr. 15, 1971, 7105085

Int. Cl. B60f 3/00

U.S. Cl. 214—147 G 15 Claims



An excavator vehicle with a crane mounted near one end rotatably about a vertical axis. The vehicle has at or near the said end two support legs with adjustable length, adapted to be pivoted at their end connected to the vehicle about a horizontal and a vertical axis and to be fixed in both directions at different angular positions relative to the vehicle. The two support legs have at their free end an at least substantially horizontal support or a wheel adapted to be rotated about a horizontal axis. The vehicle has, at its other end, a third support leg which is also pivotable at its end mounted on the vehicle about a vertical and a horizontal axis and may be fixed in both directions in different angular positions relative to the vehicle. The third support leg has at its free end a vertical plate or at least one wheel rotatable about a horizontal axis.

3,777,920

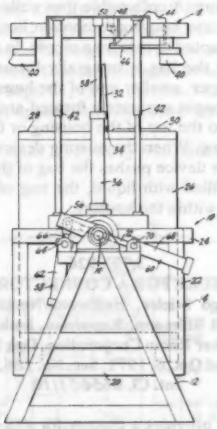
APPARATUS FOR DISCHARGING TOP DISCHARGE BINS

Delmar R. Wiese, Blue Springs, Nebr., assignor to Hoover Ball and Bearing Company, Saline, Mich.

Filed May 5, 1971, Ser. No. 140,471

Int. Cl. B65g 65/34

U.S. Cl. 214—314 5 Claims



Apparatus for discharging the contents of bins having top walls provided with discharge openings and hinged doors movable between closed positions overlying the discharge openings and upwardly projecting open positions. The apparatus comprises a main frame, a bin support frame rotatably mounted on the main frame for rotation about a substantially horizontal axis between a bin receiving position and a bin discharge position, and a retention frame which is movable toward and away from the support frame for clamping a bin on the support frame and releasing the bin for removal from the frame. A discharge funnel is mounted on the retention frame for movement to a position overlying the bin discharge opening and a bumper member on the retention frame is engageable with the open bin door for holding the door open during rotation of the support frame to discharge the bin contents by gravity through the discharge funnel. A plurality of fluid actuated cylinder assemblies on the main frame cooperate to facilitate rotation of the support frame to a position in which the bin contents will flow through the discharge funnel.

3,777,921

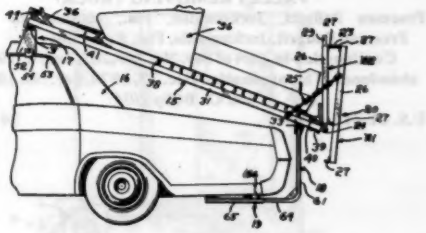
CARRIERS ATTACHABLE TO AUTOMOBILES AND FOR USE IN CARRYING VEHICLES

Bernard J. Nelson, R.F.D. 1, Rockland, Maine

Filed Feb. 24, 1971, Ser. No. 118,276

Int. Cl. B60r 9/00

U.S. Cl. 214—450 5 Claims



A carrier is disclosed that is attachable to automobiles of various types and includes a support having a ramp hingedly connected to its rear end and consisting of transversely hinged sections. The ramp may be unfolded for use in loading and unloading vehicles and folded into a substantially vertical position and then connected to the support to provide a barrier at the rear end thereof. The attachment of the carrier depends on the type of automobiles but the invention includes front and rear mounts. Desirably, both mounts are laterally adjustable and desirably the connection between the support and either or both mount is pivotable.

3,777,922

LOADER FOR ELEVATING A LOAD ONTO AN AUTOMOTIVE VEHICLE TOP

Paul A. Kirchmeyer, Redmond, Wash., assignor to Reinell Boats, Inc., Marysville, Wash.

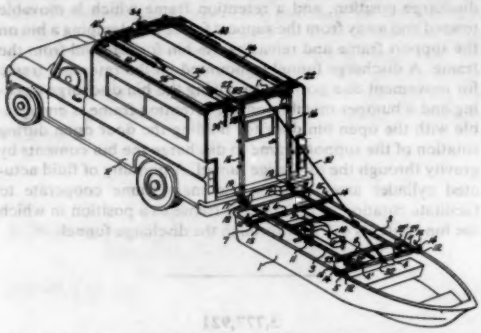
Filed Feb. 10, 1971, Ser. No. 114,203

Int. Cl. B60r 9/00

U.S. Cl. 214—450 12 Claims

A load-supporting frame is elevated to the top of an automotive vehicle, such as a camper, and shifted forward to a stowed position. In loading a boat a frame attached to the boat in horizontal attitude is first tilted into upright position alongside upright supporting links, followed by conjoint tilting of the frame and such links into horizontal position at the top of the vehicle for conjoint shifting forward into stowed position. Other types of boat are hoisted along upright members which are tilted into horizontal position when the load is raised, and

shifted forward with the load into stowed position. Elevation of the boat or other load and shifting of the load forward along



the top of the vehicle into stowed position is accomplished by a power drum pulling a single line which is connected to the load support.

3,777,923

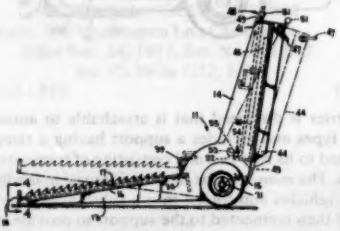
PALLET REMOVING TRUCK

Freeman Padgett, Jacksonville, Fla., assignor to Ronnie Freeman Padgett, Jacksonville, Fla., a part interest

Continuation-in-part of Ser. No. 789,287, Jan. 6, 1969, abandoned. This application Dec. 23, 1970, Ser. No. 101,047

Int. Cl. B60p *1/04*

U.S. Cl. 214—506 **14 Claims**



A truck for unloading freight on pallets or skids from a tractor trailer, or the like, includes a pair of horizontally extending forks, having upwardly extending teeth for gripping the skid or pallet wooden bottom. The forks are pivotable about a common axis, on which are mounted two sets of dual wheels. Extending from the axis, in a generally upward direction, are arms joined by a transverse strut carrying a shackle. The upwardly extending teeth on the horizontally extending forks are selectively removable so that they can be replaced as they wear.

3,777,924

SAFETY CLOSURE

James H. Kayser, Maplewood, and Gregory A. Younker, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 10, 1970, Ser. No. 88,317

Int. Cl. B65d *55/02*; **A61j** *1/00*

U.S. Cl. 215—9 **22 Claims**

A safety closure to restrict the opening of containers by children. The closure has an inner cap which is operable to open the container upon manual manipulation of a grasping surface on the inner cap. The closure also includes an inseparable outer cap which will not operate directly to open the closure, but which must be moved against the bias of a spring from a position at which it encloses the grasping surface to a position at which the grasping surface may be manually

manipulated. The outer cap may be engageable with the inner cap to move the inner cap to a sealing position on the container by manipulation of the outer cap, or the inner cap may be spring biased to its closed position.

3,777,925

DISPOSABLE NURSING DEVICE

Robert J. Eckholm, 238 Madison Ave., New York, N.Y.

Filed Dec. 23, 1971, Ser. No. 211,425

Int. Cl. A61j *9/00*

U.S. Cl. 215—11 E **9 Claims**

A disposable, nesting nursing device has an upwardly tapering outer housing of relatively rigid or stiff material open at the top and bottom. A collapsible thin walled bag open at the top is secured in the housing to contain liquid and the top of the housing is adapted to receive a nipple. In one embodiment, the open top of the bag is integrally formed with and supported by the upper, smaller end of the housing. In other embodiments, the bag is separately formed and the open top of the bag is fixed to the top of the housing or fixed in the upper half of the housing. When the nursing devices are nested, the top of each lower device pushes the bag of the device above it upward. When filled with liquid, the bag of each device extends downward within the housing.

3,777,926

CLOSURE FOR A CONNECTOR BOX

Alfred Otto Hugo Stieler, Heilbronn/Neckar, and Gerhard Leonhard Emil Billmann, Rappenau, both of Germany, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

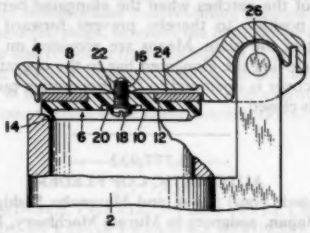
Filed Oct. 6, 1971, Ser. No. 186,900

Int. Cl. B65d *51/18*

U.S. Cl. 220—29 **5 Claims**

This invention provides a closure for a connector box. The closure includes a lid located adjacent an opening in the box which is coupled to the box by means of a hinge. A sealing member of resilient material is wobbingly coupled to the lid through a convex surface on at least one of the mutually facing surfaces of the lid and the sealing member. A spring urges the lid toward a closed position facing the opening so that the sealing member is held by the lid between the box and the lid by

the force of the spring. Since the sealing member is wobblingly coupled to the lid, its position self-adjusts to compensate for



dimensional discrepancies in the assembly when the sealing member contacts the box during closing of the lid to seal the opening.

3,777,927

FUEL TANK ESPECIALLY FOR VEHICLES

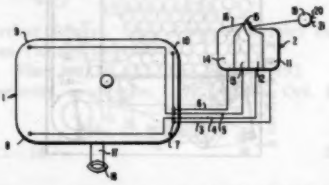
Ludwig Fricker, Stuttgart, Germany, assignor to Daimler-Benz AG, Stuttgart, Germany

Claims priority, application Germany, June 6, 1970, P 20 29 546.9

Filed June 16, 1971, Ser. No. 153,619

Int. Cl. B65d *25/00*

U.S. Cl. 220—85 R **9 Claims**



A fuel tank, especially for motor vehicles, which is equipped with a vent system that consists of vent lines, each leading from an upper corner of the fuel tank to the expansion tank.

3,777,928

PROCESS AND APPARATUS FOR PURGING GAS-CONTAINING STORAGE TANKS IN VESSELS

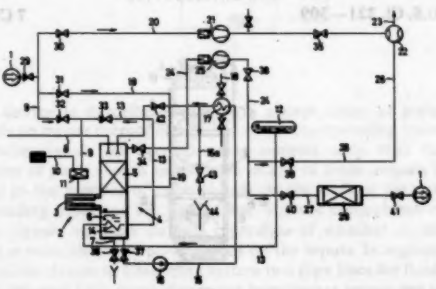
Drago Kober, Rondorf/Cologne, Germany, assignor to Liquid Gas Anlagen Union GmbH, Remagen-Rolandseck, Germany

Filed Sept. 21, 1971, Ser. No. 182,394

Claims priority, application Germany, Sept. 21, 1970, P 20 46 452.2

Int. Cl. A62c *3/12*; B01j *7/00*; B65d *25/38*

U.S. Cl. 220—88 B **17 Claims**



A process and apparatus for purging gas storage tanks comprises generating a gas inert with respect to the stored gas, displacing the stored gas in the tank with part of the inert gas and admixing another part of the inert gas with the stored gas displaced from the tanks, whereby in the case of combustible stored gas explosive mixtures are avoided. The inert gas may be generated by burning a portion of the stored gas or another fuel.

3,777,929

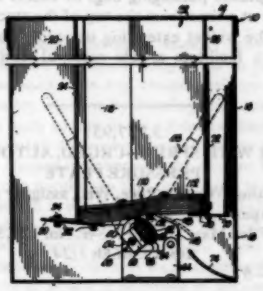
NEWSPAPER VENDOR

Warren W. Hannon, P.O. Box 103, Olathe, Kans., and Charles N. Hannon, Olathe, Kans., assignors to said Warren W. Hannon, by said Charles N. Hannon, Olathe, Kans.

Continuation-in-part of Ser. No. 751,011, Aug. 7, 1968, Pat. No. 3,608,891, which is a continuation-in-part of Ser. No. 665,540, Sept. 5, 1967, abandoned. This application Apr. 16, 1971, Ser. No. 134,675The portion of the term of this patent subsequent to Dec. 15, 1981, has been disclaimed.

Int. Cl. G07f *11/12*

U.S. Cl. 221—17 **14 Claims**

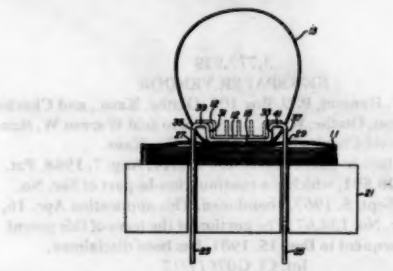


A manually operated, coin-controlled vendor permits removal of only one newspaper from a stack thereof within the cabinet of the vendor per each deposit of a preselected combination of coins. Within the cabinet the lowermost newspaper in the stack is supported along its leading and trailing edges, respectively, by separate, spaced-apart structures and in its middle portion by a series of laterally spaced, upstanding plates. A number of oscillatory grippers interspersed between the plates and controlled by an external lever arm are swung toward the rear structure into engagement with the lowermost newspaper when the arm is released by the deposit of the coins and moved in one direction. This action buckles the rear portion of the lowermost newspaper as the leading edge thereof is pulled free, and when the arm is returned to its original position, the grippers are swung toward the front structure still gripping the newspapers to unbuckle the newspaper and displace the free leading edge thereof toward the outlet of the cabinet. By reaching into the outlet, the leading edge of the newspaper may then be gripped for subsequent manual removal of the newspaper from the cabinet by pulling the trailing edge thereof free from the stack. A weight placed on top of the stack assures dispensing of the last few papers thereof by holding the same flat as the grippers oscillate therebeneath and also actuates special apparatus when the stack is depleted which, in turn, allows a display newspaper to drop through the outlet to sell out the vendor.

3,777,930
SHOULDERED WICKETS

Alvin E. Ericson, Chicago; George C. Haettinger, and Ernest T. Pedersen, both of La Grange, all of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 24, 1972, Ser. No. 246,613
Int. Cl. B65h 3/58
U.S. Cl. 221—26 11 Claims

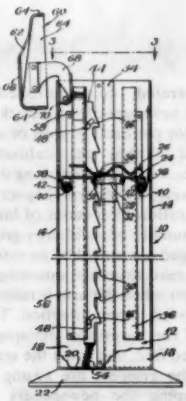


A shouldered wicket for holding a stack of flat flexible articles such as plastic packaging bags or sheets which are to be removed one at a time from the top of the stack, the shoulder portions of the wicket extending upwardly above the rest of the wicket to facilitate article removal from the wicketed stack.

3,777,931
DISPENSER WITH SPRING-URGED, AUTOMATIC-STOP PRESSURE PLATE

Larry J. Fleming, West De Pere, Wis., assignor to Fort Howard Paper Company, Green Bay, Wis.

Filed Mar. 18, 1971, Ser. No. 125,517
Int. Cl. B65h 1/24
U.S. Cl. 221—57 9 Claims

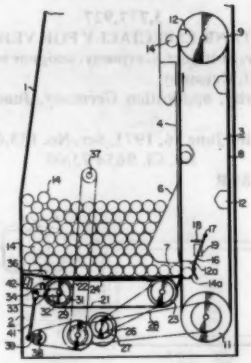


A device for dispensing napkins or the like. The napkins are received in an elongated chamber, preferably upright, and are mounted on a movable pressure plate in the chamber. Means are provided for guiding movement of this plate in the chamber in forward and reverse directions, as up and down. Springs are provided to normally bias the plate in an upward direction. Elongated catch bars are provided in the chamber and have a plurality of catches thereon. The elongated catch bars are movable between a first position at which the catches are operative and a second position at which the catches are inoperative. Members are provided on the plate to engage at least one of the catches when the elongated bars are in the operative position to thereby prevent forward or upward movement of the plate. Means are provided on a dispenser cover for moving the elongated bar to the operative position when the cover is open and to the inoperative position when the cover is closed.

3,777,932
AUTOMATIC COP FEEDER

Isamu Matsui; Shozi Sakai, and Masanobu Nishiyama, all of Kyoto, Japan, assignors to Murate Machinery, Ltd., Kyoto, Japan

Filed June 29, 1971, Ser. No. 157,878
Int. Cl. B65h 5/02
U.S. Cl. 221—204 13 Claims



Automatic cop feeder for feeding cops mounted in a container one by one in succession through a delivery path formed in the container to the next operational station while breaking possible cop bridges near inlet of the delivery path by giving shaking effect to cops in the container through alternate forward and return i.e. to and fro movements of an endless belt mounted at the bottom of the container.

3,777,933
GOLF BALL HOLDER

Adolphe Joliot, 43 Rue de Lisborne, Paris, France

Filed May 2, 1972, Ser. No. 249,558
Claims priority, application France, May 6, 1971, 7116343
Int. Cl. A63b 57/00
U.S. Cl. 221—309 7 Claims

Golf ball holder comprising an anchoring support, a tubular element adapted to receive the balls, a bottom end and an

upper end stop formed integrally with said support, said tubular element being adapted to be fitted between said end stops, and elastic means for keeping said tubular element on said support in an intermediate ball-retaining position spaced in relation to said end stops, whereby the balls can be introduced from the top and removed from the bottom of said element by reason of its elastic mobility in relation to said support. The ball holder is thus constituting both a convenient container and a dispenser of balls while being constructionally very simple.

3,777,934

SUSPENSION POLYMERIZED POLYVINYL CHLORIDE BEADS AS VAPOR PRESSURE DEPRESSANTS

Merritt R. Meeks; Roger F. Monroe, and Richard M. Weber, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 794,413, Jan. 27, 1969, abandoned. This application Feb. 24, 1972, Ser. No. 229,179

Int. Cl. B65d *83/14*; **C08f** *3/30*, *15/28*

U.S. Cl. 222—3 **5 Claims**

Porous vinyl chloride polymer beads which are substantially devoid of an exterior pericellular layer, disposed under retention in a container of gas under pressure, regulate the useful pressure discharge of the gas.

3,777,935

PULSE CAPTURE UNIT AND APPARATUS FOR CONTROLLING THE BLENDING OF TWO FLOWABLE SUBSTANCES

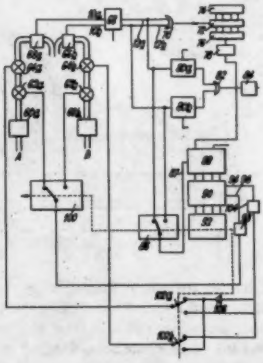
William Arthur Storey, "Little Beeches," Ashley Park Ave., Walton-on-Thames, England

Filed Jan. 10, 1972, Ser. No. 216,492

Claims priority, application Great Britain, Oct. 19, 1971, 48,595/71

Int. Cl. B67d *5/30*

U.S. Cl. 222—16 **15 Claims**



A device is described which will accept trains of pulse signals on inputs thereof and will provide corresponding trains of pulse signals on corresponding outputs such that the number of pulse signals in the train at any of these outputs is equal to the number of pulse signals on the train at the corresponding input and such that there is never coincidence of pulse signals on these outputs regardless of whether or not there is coincidence of pulse signals on the inputs. In application of the device to a blending system two pipe lines for fluids to be blended have respective pulse transducers connected to respective inputs of such a device. The transducer for the minor component of the blend provides its pulses via said device to a counter which on reaching a predetermined count corresponding to the volume of the minor component in a standard quantity of the desired blend produces a signal to close a valve in the minor component flow line. The pulses at both outputs of said device are counted together by a further counter which on reaching a count corresponding to said standard quantity re-sets the first mentioned counter causing said valve in the minor component flow line to open again.

3,777,936

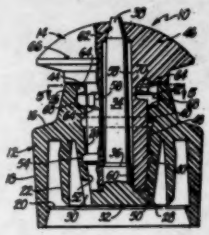
SAFETY DISPENSING CLOSURE

Robert E. Hazard, North Kingstown, R.I., assignor to Polytop Corporation, Slatersville, R.I.

Filed July 24, 1972, Ser. No. 274,399

Int. Cl. B65d *47/28*

U.S. Cl. 222—48 **7 Claims**



A dispensing closure having a linearly movable closure member mounted on a closure body so as to be capable of being moved between open and closed positions can be constructed as a safety closure by forming the closure member and the closure body so that in the closed position the closure member can be rotated in order to place interengaging means or parts on the closure member and the closure body into engagement with one another so that the closure member is held in a secured position in which it cannot be linearly moved with respect to the closure body. The closure member is preferably mounted within a cavity in the closure body and the interengaging means are preferably located generally within the area of this cavity so as not to be visible or accessible from the exterior of the closure when the closure is in a closed position.

3,777,937

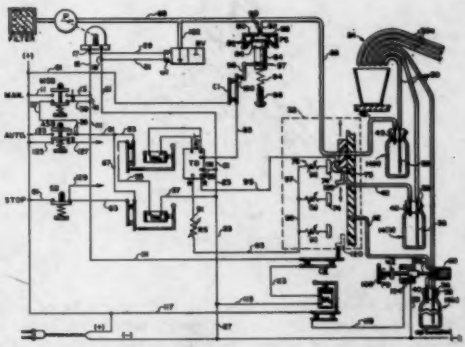
PROPORTIONAL BEVERAGE DISPENSING APPARATUS

Richard S. Buck, 146 S. Cherry Valley Rd., Wheeling, Ill.

Filed Nov. 20, 1972, Ser. No. 307,928

Int. Cl. B67d *5/30*, *5/56*

U.S. Cl. 222—70 **12 Claims**



A fully automatic, push-button controlled, electrically powered beverage dispensing apparatus for selectively

withdrawing predetermined quantities of alcoholic and non-alcoholic beverages from respective sealed containers and conducting them through riser tubes to an elevated dispensing spout for simultaneous discharge into a beverage glass or other receptacle.

3,777,938

DEVICE FOR TRANSPORTING POURABLE GOODS

Johann Nikowitz, and Michael Schwarz, both of Vienna, Austria, assignors to Waagner-Biro Aktiengesellschaft, Vienna, Austria

Filed Mar. 7, 1972, Ser. No. 232,555

Claims priority, application Austria, Mar. 8, 1971, A 1944/71

Int. Cl. B67d 5/06

U.S. Cl. 222—185 16 Claims

Device for transporting pourable goods such as liquids or solids in bulk. Liquids are situated within a container made of a foldable sheet material and having upper and lower end regions. At its upper end region the container is carried by and suspended from a frame structure while at its lower end region the container is operatively connected with a guiding structure which guides the lower end of the container for movement in a predetermined direction which preferably extends in the direction of the travel of the device.

3,777,939

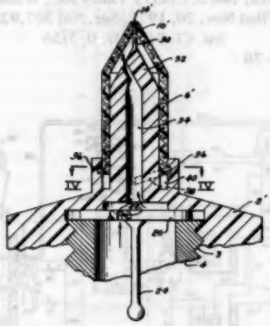
PAINT TUBE DISPENSING CAP

Hugh K. Moore, 2611 Havenhurst, Dallas, Tex.

Filed Sept. 15, 1971, Ser. No. 180,695

Int. Cl. B65d 35/14

U.S. Cl. 222—189 7 Claims



A drawing instrument comprising a flexible tube of paint having a cap detachably secured thereto which is adapted to dispense a stream of paint to form a thin thread-like bead of paint on paper. The cap is constructed of material which is not wetted by the paint to permit flow through a very small passage while minimizing pressure required to initiate and maintain flow therethrough.

3,777,940

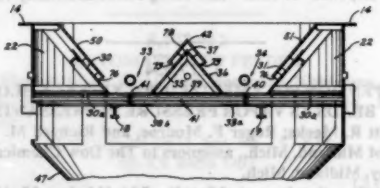
BOTTOM FLUID DISTRIBUTOR FOR SHAFT VESSELS

John B. Jones, Jr., Denver, Colo., assignor to Paraho Corporation, Denver, Colo.

Filed Nov. 10, 1971, Ser. No. 197,359

Int. Cl. B67d 5/54

U.S. Cl. 222—193 8 Claims



A vertical shaft vessel, having a solids discharge mechanism, which includes laterally directed deflection plates arranged to deflect solids to the discharge openings of the discharge mechanism, is provided with a lower annular chamber in conjunction with the discharge mechanism, which is further provided with superimposed cover plates mounted above the deflection plates defining therewith predetermined sized slots for introducing predetermined quantities of fluid through the slots into predetermined areas across the lateral extent of the vessel to provide a uniform flow of treating fluid across the lateral extent of the shaft vessel from the discharge mechanism to a first treatment zone thereabove.

3,777,941

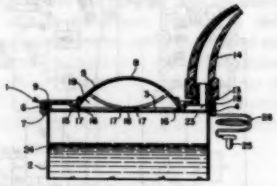
FLUID DISPENSING COVER

Hugh W. Riddle, P.O. Box 287, Ravenna, Ohio

Filed Aug. 17, 1972, Ser. No. 281,520

Int. Cl. B65d 37/00

U.S. Cl. 222—207 11 Claims



A dispenser having an outer flanged edge for gripping the edge of a container and a wall for covering the top of the container. The space between the wall and the top of the container is divided into two chambers. One of the chambers is covered by a resilient, depressible protruberance and the other chamber is covered by a portion of the wall containing a spout. Openings between the chamers permit flow of fluid to the spout for dispensing the fluid.

3,777,942

POTABLE WATER DISPENSER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Herbert R. Cunningham, 13442 Epping Way, Tustin, Calif.

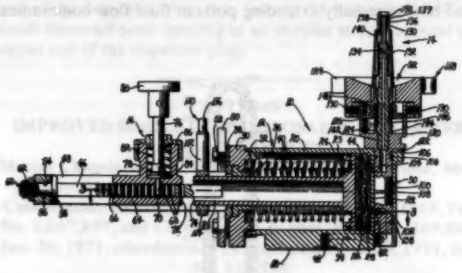
Filed June 28, 1972, Ser. No. 266,930

Int. Cl. G01f 11/06

U.S. Cl. 222—309 5 Claims

A potable water dispenser particularly suited for use in dispensing potable water into food and beverage reconstitu-

tion bags. The dispenser is characterized by an expansible chamber, selectively adjustable stop means for varying the



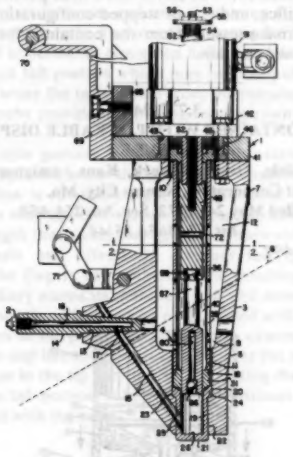
maximum dimensions achievable by the chamber, a rotary valve and a linear valve coupled in a cooperating relation for delivering potable water to and from the chamber.

3,777,943

GOOSENECK VALVE ARRANGEMENT FOR DIECASTING MACHINE

Robert H. Spalding, and James A. Spalding, both of Monroe City, Mo., assignors to Diemakers, Inc., Monroe City, Mo.

Filed Apr. 24, 1972, Ser. No. 246,675
Int. Cl. B22d *37/00*
U.S. Cl. 222—385 **10 Claims**



High speed, automatic diecasting machines include a gooseneck injector structure, partially immersed in a pot of molten metal, which contains a pump and valve arrangement for injecting molten metal into the die. Because of the severe service conditions, elements of the pump and valve require frequent service, however, the described arrangement permits these elements to be selectively and quickly removed and replaced without the need for emptying the melting pot or disassembling the entire gooseneck structure.

3,777,944

FLUID DISPENSING APPARATUS

Melvis Brooks, 440 Crestwood Ter., Hurst, Tex.

Filed Dec. 1, 1971, Ser. No. 203,552
Int. Cl. B65d *83/14*
U.S. Cl. 222—394 **5 Claims**

Apparatus, or system, for dispensing a fluid characterized by a container holding the fluid; conduit and means for effecting flow of the fluid from the container to a location where it will be used, the conduit being connected with the container and an interiorly protruding conduit portion; and a gun for dispensing the fluid. The gun is connected with the conduit and has a valve for controlling the flow of the fluid. The valve

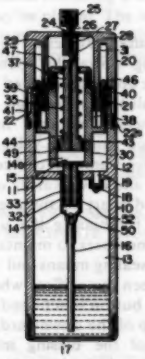
in the gun is normally biased into a closed position and manually operable into an open position, and is discrete and removable such that once it starts to be unreliable as by leaking, it can be replaced without having to replace the entire gun. Also disclosed are specific fluids and preferred structural embodiments.

3,777,945

SPRAYING DEVICE

Takamitsu Nozawa, and Takao Kishi, both of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed June 8, 1972, Ser. No. 260,960
Claims priority, application Japan, June 10, 1971, 46/41277; June 24, 1971, 46/45896
Int. Cl. B65d *83/14*
U.S. Cl. 222—394 **6 Claims**



This invention relates to a spraying device.

said spraying device comprises a container containing a liquid therein, a rotary head fitted over the top of said container, a cylindrical chamber formed in an upper portion of said container, slide means mounted in said cylindrical chamber and adapted to be moved upwardly and downwardly by the force with which said spray head is turned, and a piston mounted in the interior of said slide means and adapted to be moved upwardly as the slide means moves upwardly and moved downwardly by the biasing force of a spring mounted about said piston and serving as a restoring spring.

Said piston is formed therein with a central axial bore serving as a passage for the liquid.

Said spraying device is characterized by a transverse partition wall formed substantially in the central portion of said container to divide the container into an upper portion formed therein with a pressurizing chamber and a lower portion serving as a liquid tank, a liquid drawing line depending from the lower end of said pressurizing chamber into said liquid tank,

means provided in the side wall of said slide means and the side wall of the upper portion of said container for converting the rotary movement of the rotary head into a reciprocating movement of the slide means, a valve assembly comprising a nozzle and mounted in the upper central portion of the rotary head, and a passage formed in said transverse partition wall and having an air valve mounted in its lower portion for preventing the pressure in the liquid tank from becoming lower than atmospheric pressure.

3,777,946

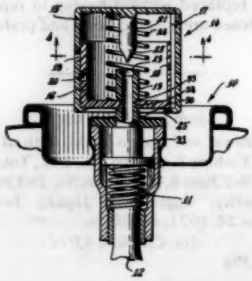
AEROSOL METERING BUTTON

Alexander Livingstone, Washington, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed May 3, 1972, Ser. No. 249,894

Int. Cl. B65d *83/14*

U.S. Cl. 222—402.2 **8 Claims**



The specific disclosure provides an aerosol metering button comprising interfitting upwardly opened and downwardly opened members. The upwardly opened member is adapted to receive an aerosol valve stem through its closed lower end. The downwardly opened member has means spaced a predetermined distance from the valve stem for sealing the opened end of the valve stem. An orifice is formed in each of the upwardly opened and downwardly opened members, and the orifices are spaced apart by the predetermined distance. Means are provided for biasing the upwardly opened and downwardly opened members to maintain the predetermined distance between the sealing means and the opened end of the valve stem, and between the orifices when the button is in an unactuated state. The button is actuated by applying an external pressure to the top of the downwardly opened member to overcome the bias of the biasing means and move the downwardly opened member relative to the upwardly opened member. The external pressure also initiates flow of aerosol contents through the opened end of the valve stem, and the flow continues until the downwardly opened member is moved the predetermined distance such that the sealing means abuts the opened end of the valve stem. At this time, the two orifices are aligned and a metered flow of aerosol contents is exhausted from the button.

3,777,947

RECIPROCATING VALVE ASSEMBLY FOR PRESSURIZED CONTAINERS

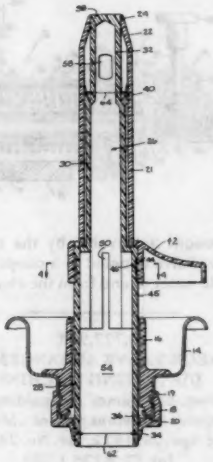
Kenneth G. Flema, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed June 5, 1972, Ser. No. 259,879

Int. Cl. B65d *83/14*

U.S. Cl. 222—402.23 **10 Claims**

A valve assembly for a pressurized container including an elongated valve body having one end mounted on a container and the other end having an exit orifice, said valve body forming a chamber adjacent the exit orifice, a piston mounted for sliding movement in the valve body and having a longitudinally extending bore therein with one end in fluid flow communication with the interior of the container and the other end having radially extending ports in fluid flow communication with the chamber. The piston has a nose portion for sealing the exit orifice, and it is of stepped configuration in order to utilize internal pressure from the container for urging it towards its closed position.



3,777,948

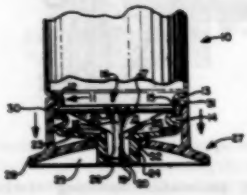
PLASTIC CONTAINER WITH LOCKABLE DISPENSING CLOSURE

Robert X. Hafele, Overland Park, Kans., assignor to Ethyl Development Corporation, Kansas City, Mo.

Filed May 24, 1972, Ser. No. 256,458

Int. Cl. B65d *25/44*

U.S. Cl. 222—497 **8 Claims**



A plastic container having flexible sidewalls adapted for dispensing fluid materials. The container neck portion is provided with two annular recessed grooves which are adapted to receive an annular locking ring provided on the interior wall of the skirt of the closure cap. A dispenser plug has its cylindrical base received between the annular grooves on the interior of the neck of the container. The neck of the container has a top flexible wall portion with an integral, upwardly extending, reduced neck section which receives the outer end of an integral boss extending from the base of the plug to close the neck opening. The cap is provided with a central opening surrounding the reduced neck portion, and, when the locking ring is in the lower annular groove, it exerts external pressure on the flexible top wall to prevent expulsion of the product from the container. When the cap is moved into the dispensing position, i.e., with the locking ring in the second or upper

groove, application of pressure to the sidewalls of the container exerts internal pressure on the flexible top wall of the container moving it out of sealing engagement with the upper end of the dispenser plug, thus forcing the contents out of the small diameter neck opening in an annular stream around the upper end of the dispenser plug.

3,777,949

IMPROVED SINGLE DOSE DISPOSABLE CONTAINER AND ACCESSORIES

Marcel Chiquiari-Arias, Insurgentes sur 403, 1st Floor, Mexico City, Mexico

Continuation-in-part of Ser. No. 861,841, Sept. 29, 1969, Pat. No. 3,667,657, and a continuation-in-part of Ser. No. 109,806, Jan. 26, 1971, abandoned. This application Dec. 23, 1971, Ser. No. 211,598

Claims priority, application Mexico, Jan. 2, 1969, 108027

Int. Cl. B65d *17/24*

U.S. Cl. 222—541 **9 Claims**

A disposable container for medicaments and the like providing a high degree of prophylaxis and accurate dosification. The container includes a generally flexible plastic body, heat-sealed at its lower end and containing a precise dose of the medicament to be dispensed. The opposite end of the body is tapered to define an elongated hollow nozzle terminating in an enlarged tab portion which may be manipulated by a consumer to sever the tab portion from the remainder of the nozzle to thereby provide an opening for dispensing the container contents.

The nozzle portion includes a length extending rearward from the tip, which is of thickened wall construction, whereby said portion is relatively rigid and therefore incompressible during the tearing off of the tab. The nozzle and tab are of sufficient length that a user may grasp the rearward portion of the rigid nozzle and effectively conduct the tearing process without the fingers contaminating the resulting nozzle opening. Auxiliary elements include a cap like member for fitting over the nozzle and having an orifice filled with a swab for the application of the contained liquid to an external surface, and a separate cap like member for fitting over the nozzle and having a recess in the tip end thereof for nesting the tab portion to enable the tab portion to be twisted off without contamination by contact with the hands.

3,777,950

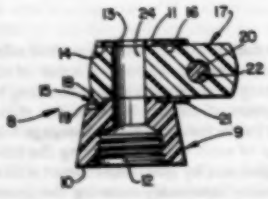
MULTI-PURPOSE CLOSURE

Daniel Kiddon, 6008 Sonoma Rd., Bethesda, Md.

Filed Sept. 7, 1972, Ser. No. 287,050

Int. Cl. B67d *3/00*

U.S. Cl. 222—554 **4 Claims**



A multi-purpose closure for attachment to the dispensing necks of closures, such as paste tubes and bottles, and which is provided with a manually actuated valve for opening or closing a bore of the closure which communicates with a bore of the dispensing neck, so that the closure need not be removed from the container neck until all of the contents of the container has been dispensed therefrom. A stop means formed in part by the valve body and in part by the closure body limits turning of the valve body through an arc of 90° between a completely closed and a completely open position. Cooperation between a bushing and a valve operating lever maintains the valve body correctly positioned in the closure body for complete registration of the valve body with the closure bore in the open position of the valve.

3,777,951

INFLATABLE WIG STAND

Robert Newsteder, South Orange, N.J., assignor to Just Design, Inc., Orange, N.J.

Filed May 31, 1972, Ser. No. 258,460

Int. Cl. A45d *44/14*

U.S. Cl. 223—67 **2 Claims**

An inflatable wig stand including a simulated head portion upon which a wig may be placed. The inflatable wig stand includes a base which supports the simulated head portion and means is provided for tightly securing the base to a flat horizontal surface.

3,777,952

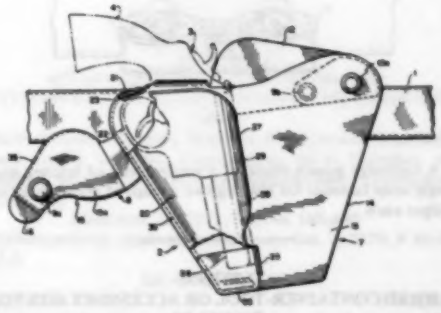
SECURE HOLSTER FOR REVOLVERS

Paris Theodore, New York, N.Y., assignor to Seventrees, Ltd., New York, N.Y.

Filed Jan. 3, 1972, Ser. No. 214,755

Int. Cl. F41b *13/04*

U.S. Cl. 224—2 B **14 Claims**



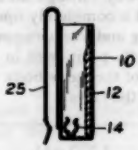
A holster to be carried high on the hip and having a trigger guard pocket, a muzzle pocket, and a breakfront flap which cooperate to prevent removal of the revolver from the holster. The breakfront flap is secured in the closed position by a fastening device which is released by the forefinger of the user to initiate the drawing of the revolver from the holster.

3,777,953

CASE FOR REMOVABLY CARRYING A WRIST WATCH

Jules Lewis, 3000 Ocean Pky., Brooklyn, N.Y.

Filed Apr. 20, 1972, Ser. No. 245,868
Int. Cl. A45c 11/10
U.S. Cl. 224—4 C 8 Claims



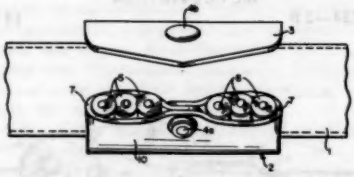
This invention relates to a protective case adapted to receive a wrist watch having a case with a pair of drilled ears or lugs in which is maintained a retaining pin assembly whereby wrist straps or bands are customarily connected to the watch. This protective case is open at the top to slidably receive a watch from which the strap is removed. A clip carried within and at the closed other end of the case removably retains the pin carried by the entering lug end of the wrist watch. A protective pad is provided on the inside of a side panel of the case, said protective pad adapted to prevent scratching of the plastic or glass face of the watch. A belt clip attached to the outer back surface of the case provides a dual purpose wherein the case may be attached or hooked over a belt or pocket of the wearer and when not used for this purpose may provide a support which engages the strap retaining pin of the watch and the watch case to support the watch at an angled relationship while the retaining case is placed on a support surface enabling the watch to be supported in a viewing condition.

3,777,954

CARTRIDGE POUCH

Paris Theodore, New York, N.Y., assignor to Seventrees, Ltd., New York, N.Y.

Filed Jan. 3, 1972, Ser. No. 214,754
Int. Cl. F42b 39/00
U.S. Cl. 224—19 1 Claim



A cartridge pouch made of a single piece of leather and a single snap fastener for holding two groups of about three cartridges each.

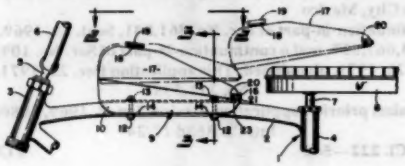
3,777,955

LIQUID CONTAINER-TOOL OR ACCESSORY BOX FOR BICYCLES

Brian W. Davies, 6200 Barton Rd., North Olmsted, Ohio

Filed Sept. 28, 1972, Ser. No. 293,015
Int. Cl. B62j 39/00
U.S. Cl. 224—35 4 Claims

A bicycle having a simulated gas tank on the top bar thereof between the steering and seat post supports which comprises a bottom tray-like member secured to said top bar for carrying miscellaneous articles such as a bicycle lock, tools, spare bicycle parts, food articles, etc., and a detachable cover for said bottom member which is in the form of a container having a filling opening at the top and a dispensing spout at the lower rear side thereof adapted to contain water, milk, coffee, fruit juice or the like. The combination liquid container-tool or accessory box herein is further characterized in that the bottom tray-like member and the upper liquid container member have nested rim portions and are provided with resilient hook



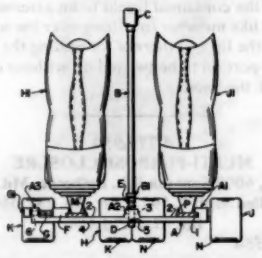
means to facilitate attachment and detachment of the liquid container member to and from the bottom tray-like member which is secured to the top bar of the bicycle. Yet another characterizing feature of this invention is that the dispensing spout is disposed at the left rear side of the liquid container so that, when the bicycle is supported on its kick stand, said dispensing spout will be located at the lowermost portion of the container for dispensing substantially the entire contents thereof without need for removing the same from the bottom tray-like member.

3,777,956

ROLLER SKATE CARRIER

David H. Jung, 1262 B St., Hayward, Calif.

Filed May 24, 1971, Ser. No. 146,357
Int. Cl. B65d 71/00
U.S. Cl. 224—45 S 1 Claim



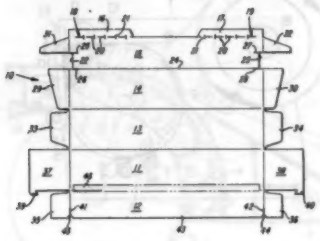
A roller skate carrier comprising a base bar adapted to engage with the interconnecting straps of a pair of roller skates, the interconnecting strap of each skate extending between the front and rear pairs of rollers. Novel roller skate clamping means is carried by the base bar and will engage with the interconnecting strap of each skate for forcing the pair of skates, which are arranged side by side, into contact with each other, the clamping means removably securing the interconnecting strap of each skate to the base bar. A center post extends upwardly from the center of the base bar and it is provided with a handle at its upper end.

3,777,957

DISPENSING CARTON

Kenneth T. Buttery, Kalamazoo, Mich., assignor to Brown Company, Kalamazoo, Mich.

Filed Aug. 2, 1972, Ser. No. 277,374
Int. Cl. B26f 3/02
U.S. Cl. 225—50 10 Claims



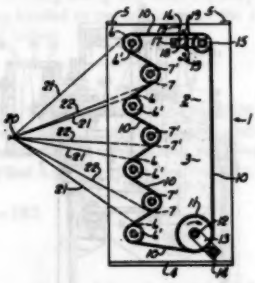
A paperboard carton for packaging and dispensing from a roll stock a sheet-form material such as film, foil, or the like, comprises a hinged cover member provided with notches in the cover front panel thereof and with projecting lock tabs on the carton body which lock tabs project through and engage said notches.

3,777,958

METHOD OF SEPARATING CONTINUOUS FORM STATIONERY

Joseph P. Graham, Farm Ln., Rochester, Pa.

Filed June 28, 1972, Ser. No. 266,982
Int. Cl. B26f 3/02; B65h 41/00
U.S. Cl. 225—4 3 Claims



The method of separating continuous strip form stationery having multiple plies secured together at their longitudinal edges and having periodic transverse tear perforations defining separate stationery forms wherein the plies are initially separated at one leading end of the continuous form and attached to spaced parallel and coextending rollers rotatably supported on a frame in sequence respectively. The rollers are rotatably driven in unison at the same rate to deleave the multiple ply continuous form stationery into individual continuous form plies. The individual plies are then unrolled and each separated at the transverse perforations to provide separate stationery forms.

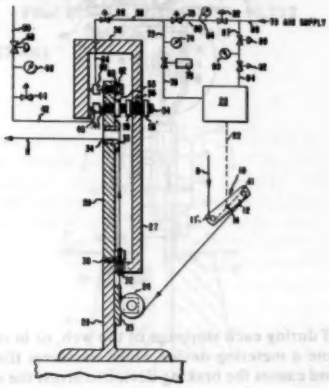
The unrolling and separating of individual plies into separate stationery forms is preferably accomplished by sequentially feeding the trailing end of each individual ply rolled on its respective roll into an automatic bursting machine.

3,777,959

APPARATUS FOR MONITORING AND CONTROLLING TENSION IN AN ADVANCING FLEXIBLE ELONGATE MATERIAL

John Seymour Seney, Seaford, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 25, 1972, Ser. No. 229,456
Int. Cl. B65h 25/00
U.S. Cl. 226—25 4 Claims



An apparatus for detecting and regulating tension in a textile rope being pulled in a path from a source through a tension adjusting means by an advancing means includes a beam pivotally mounted for angular movement about an axis transverse to the beam and a guide arrangement to direct the rope through the beam pivot axis. One guide of the arrangement is carried by the beam at a location downstream of the pivot axis, the other being located upstream of the pivot axis. Passing the rope through the axis nullifies the effect of changes in frictional properties of the rope on tension induced deflection of the beam. Means are provided for detecting the amount of said angular movement of the beam and transducing it into a signal to actuate a control means for operating the tension adjusting means.

3,777,960

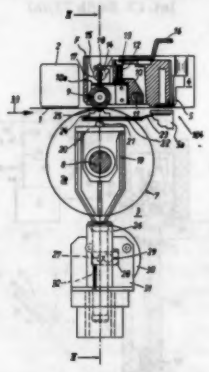
APPARATUS FOR TRANSPORTING AND INTERMITTENTLY BRAKING WEBS OF PAPER OR THE LIKE

Volker Weinert, Munich; Gerhard Frankiewicz, Sauerlach, and Gunter Engelage, Unterhaching, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 28, 1971, Ser. No. 184,498
Claims priority, application Germany, Oct. 2, 1970, P 20 48 413.3
Int. Cl. B65h 23/06
U.S. Cl. 226—33 23 Claims

Apparatus for intermittently moving a web of photographic film lengthwise has a driven roller which engages the underside of the web, a small idler roller which is normally biased against the upper side of the web opposite the driven roller, and a braking device having a cylindrical braking element movable by an electromagnet against the underside of the web to disengage the web from the driven roller, to move the idler roller away from the driven roller by way of the web, and to

press the web against the idler roller to thus effect rapid stoppage of the web. The electromagnet is energized at predetermined intervals in response to detection of marks which are applied to a processed web at the same intervals as the frame lines between successive frames so that the frame lines can be



cut in half during each stoppage of the web, or in response to signals from a metering device which measures the length of the web and causes the braking device to arrest the web whenever an unexposed frame of the web registers with the exposing station of a photographic copying machine.

3,777,961

INTERMITTENT MOVEMENT FOR FEEDING FILM

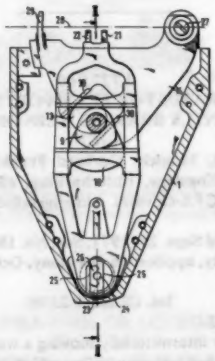
Otto Blaschek, Anwanderweg 6, Munich, Germany

Filed May 9, 1972, Ser. No. 251,794

Claims priority, application Germany, June 30, 1971, P 21 32 580.4

Int. Cl. G03b *1/28*

U.S. Cl. 226—57 **12 Claims**



The intermittent movement comprises pull-down claw means and registration pin means. The registration pin means comprise a rocker lever having a curved tip portion which is concentric with the bearing.

3,777,962

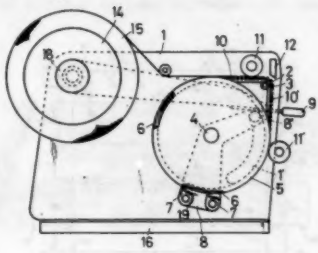
APPARATUS DRAWING-OUT FOR WINDING TAPE

Fumiko Tange, 6-35 Oaza Sakae Aza Kamiubako, Toyonakecho, and Kiichi Tsuda, 5-7, 2-chome, Tomigaoka, Nara, both of Japan

Filed Apr. 7, 1972, Ser. No. 241,899

Int. Cl. B65h *17/26*

U.S. Cl. 226—129 **3 Claims**



A device for drawing out tape material which has a hand lever actuated ratchet wheel actuating a swinging arm which in turn engages a chain for drawing the tape from a tape supply each time the arm is moved.

3,777,963

CARRY-OUT CARRIAGE DEVICE OF PEELING MACHINE

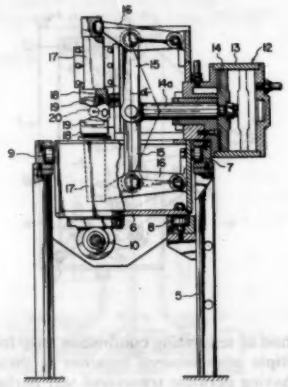
Akira Yamamoto, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 27, 1972, Ser. No. 301,299

Claims priority, application Japan, Oct. 29, 1971, 46/100111

Int. Cl. B23q *3/08*

U.S. Cl. 226—145 **4 Claims**



A carry-out carriage device of a peeling machine which has a pair of clamper pads, a pair of clamper rods slidably supported in opposite directions against the feeding center of a blank and fixing the clamper pads at the respective opposite ends, a movable base, a pair of levers pivotally secured symmetrically with respect to the feeding center of the blank at the movable base side to the bases of the clamper rods at the opposite ends, a pair of rods rotatably connected to the intermediates of the levers at the opposite ends, a cylinder device having a piston and a piston rod coaxially rotatably connected to the other ends of the rods to operate in the direction perpendicular to the operational direction of the clamper rods.

3,777,964

ROD ENTRY GUIDE

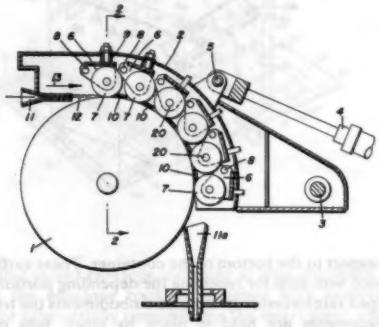
Rolf Kruner, Muelheimerstrasse 199; Hans Thelen, Nikolaistrasse 93, and Gerhard Grunwald, Duesseldorferstrasse 501, all of 4100 Duisburg, Germany

Filed Apr. 24, 1972, Ser. No. 247,167

Claims priority, application Germany, Apr. 29, 1971, P 21 21 126.7

Int. Cl. B65h *17/22*

U.S. Cl. 226—183 14 Claims



Mechanism consisting of a large driven pulley and a plurality of small rollers aligned along about 90° of the periphery of the driven pulley for changing the direction of rolled rod coming from a rod mill from horizontal to vertical for delivery to a laying reel or other rod collecting mechanism.

The small rollers in one form are carried by pivoted arms mounted on a support and are individually spring-pressed toward the driven pulley permitting acceptance therebetween of the oncoming rod and the application of correct pressure against the rod as it changes direction from horizontal to vertical. In another form, the small rollers are carried by the links of a chain extending along the driven pulley perimeter. The chain is spring-loaded to permit entry of the rod and between the pulley and rollers.

3,777,965

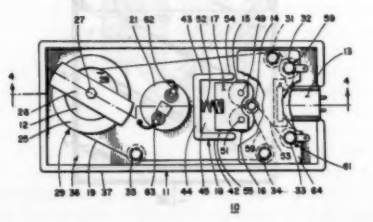
TAPE DRIVE MECHANISM

Helmut C. Maiershofer, Scottsdale, and Walter J. Noble, Mesa, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 24, 1972, Ser. No. 283,483

Int. Cl. B65h *17/22*

U.S. Cl. 226—183 8 Claims



There is disclosed a tape drive mechanism for a continuous tape wherein two pressure rollers, one on each side of the driving capstan, are formed of non compliant material and engage the non compliant surface of the capstan through the intervening tape. The use of all non compliant surfaces prevents deformation thereof and avoids the development of wows in the recording.

The bearing of the roller on the input side of the capstan is a friction bearing, and the bearing on the output side of the capstan is an antifriction bearing such as a ball bearing. This creates a differential friction drive which causes a slight drag on the tape input side and thus eliminates tape overrun when the recorder is turned off.

The use of a relatively few injection molded parts results in a low cost and simple device.

3,777,966

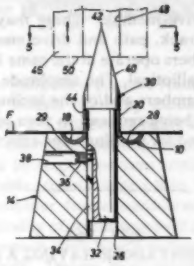
MEANS FOR SETTING GROMMETS IN WOVEN FABRICS

Victor J. Green, 8121 Barkley Dr., Houston, Tex.

Filed Feb. 12, 1970, Ser. No. 10,712

Int. Cl. B21j *15/14*

U.S. Cl. 227—61 5 Claims



A method of and apparatus for setting grommets in woven fabrics without cutting strands of the fabric, or with the cutting only of strands of the fabric which extend in directions other than the direction of the pull which will be exerted on the fabric when the article is in use. The apparatus includes a fabric penetrating device designed to be used in conjunction with grommet setting tools to form an opening in the fabric by penetrating the fabric between the strands or moving strands or threads of the fabric apart without severing the same to permit the insertion in the opening of one part of a grommet to be set in the fabric. The penetrating device may have a cutting edge positioned to cut a limited number of strands or threads of the fabric extending in a direction normal to the direction of the pull which will be exerted on the fabric during use of the article formed therefrom, in order to facilitate the penetration of the fabric to form the grommet opening therein without severing strands upon which the pull will be exerted.

The method of the invention comprises forming a grommet receiving opening in a woven fabric by inserting a penetrating device therethrough between strands of the fabric to separate the strands without cutting the same, and inserting and setting a grommet in the opening so formed. The method may include the cutting of a limited number of strands of the fabric which extend in directions other than the direction in which strands of the fabric would be subjected to a pulling force in the use of the article of which the fabric is formed.

3,777,967

FRICTION WELDING APPARATUS

John Gilbert Searle, Hednesford, and David John Hunt, Rugeley, both of England, assignors to Allwood, Searle & Timney Limited, Digbeth, Walsall, England

Filed Feb. 10, 1972, Ser. No. 225,254

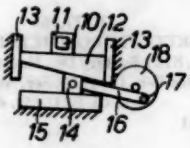
Claims priority, application Great Britain, Feb. 10, 1971, 4,397/71; Apr. 29, 1971, 12,271/71

Int. Cl. B23k *27/00*

U.S. Cl. 228—2 8 Claims

In or for friction welding apparatus of the kind in which frictional heat is generated by causing one of the components to

be welded to follow repeatedly a given path without rotation while in frictional engagement with the other component, the support for that component has a track, and there is a path inclined at less than 45° to that track, and there is a drive member caused by drive means to reciprocate along the track and path. This causes the component-support to reciprocate in a direction transverse to the track with an amplitude less



than that of the drive member. There may be two or three such assemlies of track, path and drive member so arranged that the drive members operate at the same frequency and the path is circular or elliptical. The amplitude of the reciprocation of the drive members and/or the inclination of the paths may be capable of being reduced to zero to enable the components to be centred for welding to be effected.

3,777,968

BEVERAGE CONTAINER HAVING A FRANGIBLE CLOSURE

William J. H. Law, 271 Madison Ave., Port Chester, N.Y.

Filed Dec. 27, 1971, Ser. No. 212,448

Int. Cl. B65d *1/08, 3/00, 5/00*

U.S. Cl. 229—7 R **3 Claims**

A beverage container is disclosed having a cup and a lid in which the lid is scored or otherwise provided with a line of weakness such that the rim of the lid can be pulled loose to break off a minor portion of the lid and provide a drinking aperture.

3,777,969

BULK CONTAINER REINFORCEMENTS

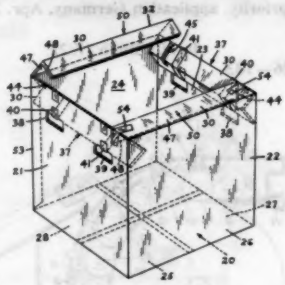
Thomas C. Nurre, Downers Grove, Ill., assignor to International Paper Company, New York, N.Y.

Filed Feb. 24, 1972, Ser. No. 229,067

Int. Cl. B65d *5/06*

U.S. Cl. 229—37 E **9 Claims**

A fiberboard container made from a rectangular blank and having inwardly directed reinforcements of triangular cross-section along two of its opposed upper edges and inwardly directed reinforcements of inverted L-shaped cross-section along the other two upper edges. The triangular reinforcements are each formed from two and sometimes three integral panels which are arranged such that the upper surfaces of the reinforcements are downwardly inclined at an acute angle



with respect to the bottom of the container. These surfaces are provided with slots for receiving the depending portions of the L-shaped reinforcements. In some embodiments the triangular reinforcements are held in place by tapes, tabs or other fasteners on the adjacent side wall.

3,777,970

HANDLE-TYPE CARRYING BAG MADE OF PLASTICS MATERIAL SHEETING

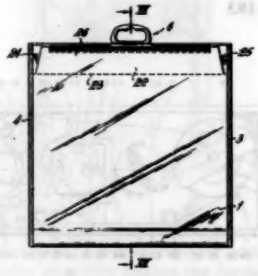
August Schwarzkopf, Lengerich/Westphalia, Germany, assignor to Windmoller & Holscher, Lengerich, Westphalia, Germany

Division of Ser. No. 49,084, June 23, 1970. This application June 27, 1972, Ser. No. 266,563

Claims priority, application Germany, June 24, 1969, P 19 32 047.9; Oct. 31, 1969, P 19 54 944.1; Apr. 27, 1970, P 20 20 549.6; Apr. 27, 1970, P 20 20 548.5; May 22, 1970, P 20 25 107.4

Int. Cl. B65d *33/00*

U.S. Cl. 229—54 R **4 Claims**



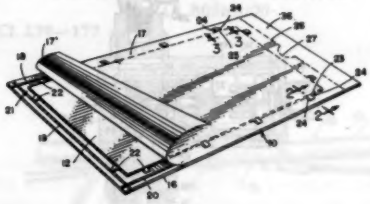
Only one wall of the bag is provided with a heat-sealed carrying handle made of still synthetic thermoplastics. The other wall of the bag is provided with a lead-out slot on the level of the lower end of the handle and has a reversely foldable portion extending beyond said lead-out slot.

3,777,971

STUFFED SEALED ENVELOPE ASSEMBLY AND METHOD

Donald J. Steidinger, Barrington, Ill., assignor to Wallace Business Farms, Inc., Hillside, Ill.

Filed Sept. 16, 1971, Ser. No. 180,992
Int. Cl. B65d *27/00*
U.S. Cl. 229—68 R 3 Claims



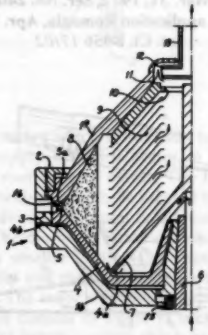
A stuffed sealed envelope including at least one insert sheet wherein the envelope back is equipped with embossment means for substantially immobilizing the insert sheet while affording improved separability.

3,777,972

SLUDGE CENTRIFUGE

Ove Allan Valentin Kjellgren, Stockholm, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Mar. 17, 1972, Ser. No. 235,633
Claims priority, application Sweden, Mar. 25, 1971, 3877/71
Int. Cl. B04b *1/12*
U.S. Cl. 233—20 A 3 Claims



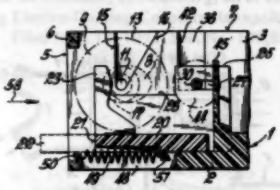
Spaced around the periphery of the centrifugal rotor are permanently open nozzles for discharging sludge separated from the liquid fed to the separating chamber of the rotor. To remove the sludge cushions accumulating on the peripheral wall of this chamber between the permanently open nozzles, the rotor periphery has at least one sludge outlet which is alternately opened and closed by an axially movable piston valve.

3,777,973

ZERO SETTING ROLLER COUNTING MECHANISM

Heinrich R. Kundisch, and Werner K. Pfundstein, both of Schwenningen/N, Germany, assignors to Irion & Vosseler, Schwenningen/N., Germany

Filed Feb. 23, 1973, Ser. No. 335,137
Claims priority, application Germany, Mar. 17, 1972, P 22 12 882.1
Int. Cl. G06c *15/42*
U.S. Cl. 235—144 HC 10 Claims



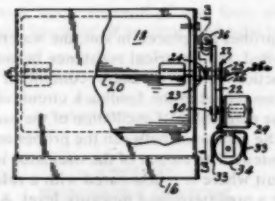
The mechanism includes a counter frame and a plurality of toothed counting wheels rotatably mounted on a common shaft and each having a respective heart-shape resetting cam fixed thereto. To reset the counting mechanism to zero, the cams are actuable by respective zero setting fingers of a zero setting rake operable, against spring bias, by a resetting slide shiftable in the counter frame transversely of the counting wheel shaft. A plurality of counting wheel stepping pinions are mounted on a common shaft which is displaceable radially of the counting wheels. During zero setting of the counting wheels, the pinions are disengaged therefrom and are maintained in their respective angular orientations by fixed elastic tongues. The resetting slide includes a plate having a width substantially equal to the axial length of the counting wheel set, and the zero setting fingers are arranged in fixed positions on this plate. The plate has wall portions extending from its opposite longitudinal edges and mounting the common shaft of the pinions in parallel with the common shaft for the counting wheels. The common pinion shaft is mounted in elongated slots so as to be shiftable relative to the slide against frictional resistance produced by spring pressure. Releasable detent means are provided to latch the slide in a position in which the pinions are engaged with the respective counting wheels.

3,777,974

DAMPER CONTROL MECHANISM

Albert J. Sparks, 8140 Summerfield, Lambertville, Mich.

Filed Apr. 17, 1972, Ser. No. 244,718
Int. Cl. F16k *31/54, 31/04*
U.S. Cl. 236—49 6 Claims



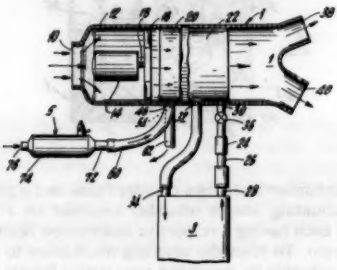
A damper control mechanism for a damper which is pivotally mounted in a duct by a shaft comprising a gear sector fixed to the shaft and an electric motor pivotally suspended from said shaft and having a gear meshed with said gear sector. The electric motor comprising a low-voltage type and the battery for operating the same is suspended in the same manner as the motor. The mechanism can be mounted within or externally of the duct.

3,777,975

SPACE HEATER HAVING A HEATING AIR FLOW DUCT WITH A HEAT EXCHANGER FOR ENGINE COOLING WATER AND ONE FOR COMBUSTION GASES

Siegfried Kofink, Lenzhalde, Germany, assignor to J. Eberspacher, Esslinger, Germany

Filed Nov. 23, 1971, Ser. No. 201,352
Claims priority, application Germany, Mar. 3, 1971, P 21 10 182.6
Int. Cl. B60h *1/02*
U.S. Cl. 237—12.3 A 13 Claims



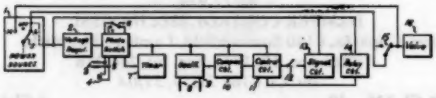
A space heater particularly for automobiles comprises a heating air flow passage in which is positioned a heat exchanger which is supplied with water from an engine cooling system and a second heat exchanger which is supplied with combustion gases from a separately operated fuel burner.

3,777,976

ELECTRONICALLY CONTROLLED WATERING

Slavko Milovancevic, P.O. Box 402, Torrance, Calif.

Filed Mar. 29, 1973, Ser. No. 346,179
Int. Cl. A01g *25/00*; B05b *17/04*; G01w *1/14*
U.S. Cl. 239—64 5 Claims



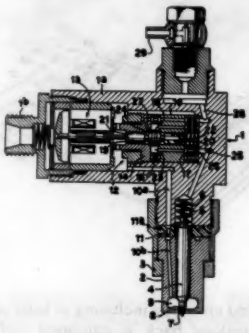
A pair of probes are placed in soil, the watering of which is to be controlled, the electrical resistance between the probes being a function of the moisture content of the soil. The probes are connected in the feedback circuit of an electronic oscillator, the magnitude of oscillation of the oscillator being a function of the resistance between the probes and thus the soil moisture content. The output of the oscillator is fed to a comparator circuit where it is compared with a reference voltage representing a predetermined moisture level. A control signal is generated in the comparator circuit whenever the soil moisture content is below the predetermined level during the periodic checkup, this control signal operating a warning signalling circuit. After a predetermined time has elapsed, during which a warning signal is generated, a watering control circuit is actuated which effects the watering of the soil for a predetermined period of time. In cases when manual operation is desirable or if automatic controll fails provision has been made for manually controlled operation.

3,777,977

INJECTION DEVICE

Marcel Regneault, Colombes, and Jean Perez, Levallois-Perret, both of France, assignors to Automobiles Peugeot, Paris, France

Filed June 26, 1972, Ser. No. 266,252
Claims priority, application France, July 8, 1971, 7125045
Int. Cl. F02m *41/16*
U.S. Cl. 239—96 5 Claims



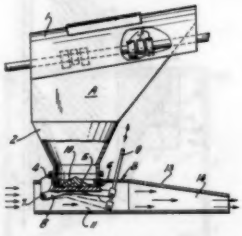
Injection device in which a first chamber, located at the pointed end of the injector needle and partly defined by the seat for the end of the needle, permanently communicates with a source of fuel under pressure, such as the fuel injection pump. A second chamber into which the rear end portion of the needle extends is put in communication by a distributor valve alternately with said source of fuel and with an enclosure in which a substantially lower pressure prevails, such as a pressure in the neighborhood of atmospheric pressure.

3,777,978

AERIAL DISTRIBUTOR FOR PARTICULATE MATERIALS

Radu Adrian M. Manicatide; Ion Olteanu, and Petre Georgescu, all of Bucarest, Romania, assignors to Institutul de Mecanica Fluidelor si Constructii Aerospatiale, Bucarest, Romania

Filed Mar. 31, 1972, Ser. No. 240,154
Claims priority, application Romania, Apr. 5, 1971, 66479
Int. Cl. B05b *17/02*
U.S. Cl. 239—171 5 Claims



The invention refers to a device and apparatus for the aerial spreading of solid materials, in powder and granular form.

The device consists of a receptacle for the materials to be dispersed, in the form of a shallow box, open in the front and back, the upper face of which is traversed by a cylindrical mouth with a lid. The lid, with a joint, is controlled by means of a rod. A diffuser is united to the box and is horizontally flared and divided by vertical walls into flow channels which widen. Pivoting shutters, on the walls, permit the control of the transverse distribution.

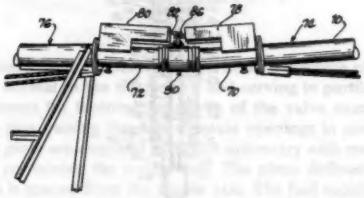
The equipment comprises a tank for materials, of somewhat tapered form elastically supported in the plane fuselage and connected to the cylindrical mouth.

3,777,979

MOBILE IRRIGATION SYSTEM AND PIPE COUPLING

Max H. Ririe, Gering; Murray C. Roland, and Rich Olson, both of Scottsbluff, all of Nebr., assignors to Lockwood Corporation, Gering, Nebr.

Filed Mar. 24, 1972, Ser. No. 237,796
Int. Cl. B05b *3/00*
U.S. Cl. 239—177 6 Claims



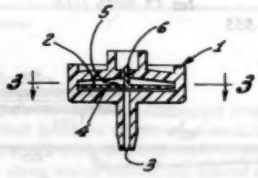
A connection between pipe sections making up an elongate water distributing pipe for mobile irrigation apparatus to permit pivotal movement between interconnected pipe sections while maintaining a sealing relationship therebetween.

3,777,980

IRRIGATION FITTING

Davies Allport, 966 Muirlands Vista Way, La Jolla, Calif.

Filed Nov. 3, 1972, Ser. No. 303,521
Int. Cl. A62c *23/06*
U.S. Cl. 239—272 5 Claims



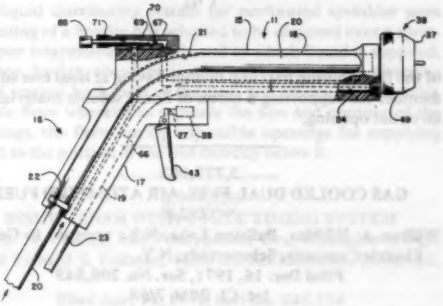
A fitting is provided which is intended to be inserted into a water pipe to supply irrigation water in controlled limited amounts to the root zone of plants. The fitting consists of a hollow cylinder with an inlet hole located in the center of one end of one cylinder and an outlet hole located in the center of the other end. The diameter of the entrance and outlet holes are considerably smaller in diameter than the hollow cavity within the cylinder and they are all located coaxially over the same centerline. The inner wall of the cavity on the outlet end of the cylinder is conical in shape in such a way that a flat resilient disc held lightly against this face will be in contact with the face only around its circumference. Additional pressure across the face of the disc will cause the disc to deform into the conical face which forms a seat for the disc. When water pressure is applied to the fitting a pressure differential across the disc results and the disc is forced against its seat and would seal the outlet hole and prevent water from passing if the surface of contact were smooth. However, these surfaces are textured so that water can seep across the seat in a multiplicity of restricted paths and flow out the outlet hole. The amount of water flow at any one pressure is determined by the size and shape of the textured pattern. When the water is turned off the disc pulls away from its seat and returns to its original flat shape and when water is again turned on, a small amount of water becomes entrapped in the seat area and as pressure builds up, the entrapped water is extruded out of the seat area through the outlet hole, flushing any solids that may tend to clog the restricted paths.

3,777,981

SPRAY APPARATUS AND METHOD

Richard O. Probst; Kenneth R. Pollard, both of Indianapolis, and Frank R. Stockton, Brownsburg, all of Ind., assignors to Ransburg Electro-Coating Corp., Indianapolis, Ind.

Filed Nov. 18, 1971, Ser. No. 199,856
Int. Cl. E01b *1/00*
U.S. Cl. 239—1 10 Claims



Powder color change is accomplished easily and conveniently by providing a spray device having a channel or groove in its side and traversing its length in combination with one of a plurality of elongated, flexible powder feed tubes. The channel is formed from rigid material. One end of each of the feed tubes is connected to its cooperatively associated powder pump immersed in a powder reservoir. Each feed tube is adapted to be snapped into or out of the channel or groove of the spray device. The feed tube is retained in the channel in such a manner as to prevent harmful movement thereof with respect to the channel and other components of the device during the spraying operation. However, the feed tube is retained in the channel in such a manner as to permit the user to remove the tube from the channel without employing undue force or special tools. The feed tube selected to be snap fitted into the channel of the spray device dictates the color of the powder to be sprayed upon activation of the spray device.

The system employing the spray device includes control means for switching from one powder reservoir to another powder reservoir upon removal of one feed tube from the spray device and insertion of another feed tube into the spray device.

3,777,982

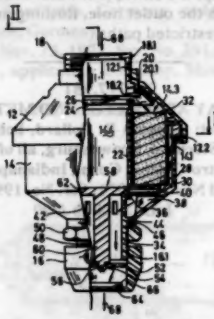
DISPENSING DEVICES

Anthony Sidney Britton, P.O. Box 11459, Cape Town, Republic of South Africa

Filed May 23, 1972, Ser. No. 256,156
Claims priority, application South Africa, May 28, 1971, 71/3449
Int. Cl. B05b *1/18*
U.S. Cl. 239—315 5 Claims

The invention discloses a dispensing device including a first housing part having an inlet opening, which is adapted for connection to a liquid supply, and an outlet opening; a second

housing part adapted for connection to the first housing part and having an inlet for communication with the outlet opening



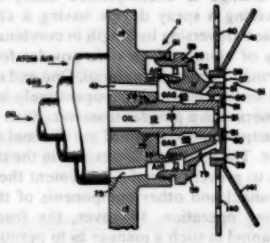
of the first housing part and further having at least one support member for supporting a block of liquid soluble material, and an outlet opening.

3,777,983

GAS COOLED DUAL FUEL AIR ATOMIZED FUEL NOZZLE

William A. Hibbins, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 16, 1971, Ser. No. 208,843
Int. Cl. B05b *7/08*
U.S. Cl. 239—422 **7 Claims**



A dual fuel, air-atomized, fuel nozzle of the type prevalent in some gas turbine combustion chambers wherein the hot atomizing air conduit is remotely positioned with respect to a central liquid fuel or oil conduit so that the nozzle will operate cooler during liquid fuel operation. A gaseous fuel conduit is interposed between the liquid fuel conduit and the atomizing air conduit to provide additional nozzle cooling during the gaseous fuel operation while preventing thermal breakdown of any liquid fuel residuum which could cause nozzle clogging.

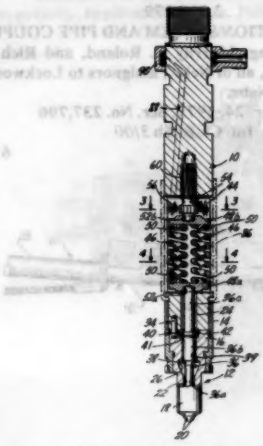
3,777,984

MINIATURE FUEL INJECTION NOZZLE AND HOLDER ASSEMBLY

Jack F. Greathouse, Hagerstown, Md., assignor to Mack Trucks, Inc., Allentown, Pa.

Filed Jan. 20, 1972, Ser. No. 219,347
Int. Cl. F02m *47/00*
U.S. Cl. 239—533 **23 Claims**

A miniature fuel injection nozzle and holder assembly for internal combustion engines includes a holder body formed with a transverse slot or slots in which two or more parallel compression springs are symmetrically disposed about the axis of the nozzle valve, upon which they act. The springs are insertable into and removable from the holder body through its side by means of the slots. Interchangeable spring guides may be employed to receive adjacent ends of the springs for alignment and transmission of their compressive forces to the nozzle valve. In one embodiment, access for adjustment of the compression of the springs, and thus the valve opening pressure, may be had through the transverse slots.

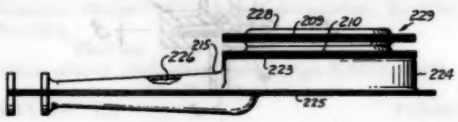


3,777,985

WATER HEATER

Robert L. Hughes, and John E. Rouse, both of West Covina, Fla., assignors to Vaskor Industries, Inc., Glendora, Calif.

Division of Ser. No. 143,899, May 17, 1971, Pat. No. 3,704,629. This application July 27, 1972, Ser. No. 275,626
Int. Cl. B05b *1/14*
U.S. Cl. 239—555 **5 Claims**



A water heater for heating water as it is being delivered, commonly called an "instantaneous water heater." The heater includes a plurality of concentric tanks which are at least partially axially overlapping and which are spaced from one another to pass hot gases in heat transfer relationship with their sidewalls. The sidewalls of the tanks are generally cylindrical. The tanks are interconnected so as to permit the flow of water to and from each of them. An inlet manifold discharges into each tank, preferably along an axis which is skew to the central axis whereby to give the water, as it flows through the tank, both a circumferential and an axial component, thus aiding in keeping the tank clean and preventing thermal "stacking" of the water. The tanks are preferably formed from concentric half-shells which are welded together at their end seams, and which have telescopic necks projecting from their sidewalls that are welded together to form a structural joinder and a fluid interconnection. A burner is placed beneath the group of tanks with deflector jets which aid in confining the rising products of combustion to a relatively narrow cross-section, so as to inject a maximum BTU input into a relatively small heater cross-section.

3,777,986

FUEL INJECTION NOZZLE

Richard Kinzel, and Walter Mladek, both of Stuttgart, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 31, 1972, Ser. No. 239,929
Claims priority, application Germany, Apr. 23, 1971, P 21 19 973.5
Int. Cl. B05b 1/32
U.S. Cl. 239—533 5 Claims

In a fuel injection nozzle that has an intermediate plate extending normal to the nozzle axis and serving in particular as an abutment for limiting the stroke of the valve needle, the aligning pins passing through separate openings in said intermediate plate are disposed in mirror symmetry with respect to a plane containing the nozzle axis. The plane defined by the pin axes is spaced from the nozzle axis. The fuel supply channel or channels which extend within the fuel injection nozzle and which pass through openings in the plate are also in mirror symmetry with respect to the first-named plane.

3,777,987

IRRIGATION DEVICE

Davies Allport, 966 Muirlands Vista Way, La Jolla, Calif.

Filed Aug. 4, 1972, Ser. No. 277,897
Int. Cl. B05b 15/00
U.S. Cl. 239—542 5 Claims

An improved device is provided to supply irrigation water in controlled limited amounts to the root zone of plants. The device is constructed from an outer tube or pipe suitable for carrying water along which outlets are spaced as required for the particular crop being irrigated. An inner tube which may be an osmosis membrane; or which may be formed of resilient material, with spaced holes therein; is fitted inside the outer pipe in such a way that water pressure in the inner tube keeps the inner tube in contact with the inside wall of the outer pipe. The surface between the inner tube and the outer pipe is preferably textured with a pattern that provides multiple, continuous, restricted paths through which the water must flow from the inner tube to the outer pipe. The holes in the inner tube are located so that water passing from the interior of the inner tube to the outlets in the outer pipe must travel along these restricted paths. Therefore, the shape and size of the texturing and the distance the water travels along the restricted paths provide flow control of the water supplied to the plants in the limited quantities desired.

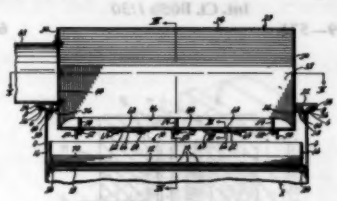
As flow control is obtained from the restricted areas, the holes in the inner tube and the outlets in the outer pipe may be relatively large and clog free. Furthermore, the resilient inner tube is of such a design that with the water turned off it will separate from the outer pipe. When turned on again, a small quantity of water flows into the textured area between the inner tube and outer pipe, and as the pressure builds up the extra water is extruded out of the outlets in the outer pipe flushing with it any solids that may tend to clog the restricted paths.

3,777,988

LIQUID DISTRIBUTING SYSTEM FOR SPRINKLER PANS

Ralph F. Thompson, Grandview, Mo., assignor to Salco, Inc., Grandview, Mo.

Filed Apr. 6, 1972, Ser. No. 241,759
Int. Cl. B05b 1/14
U.S. Cl. 239—553.3 6 Claims



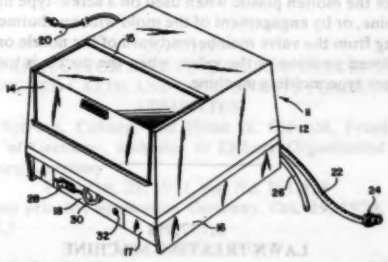
A liquid distributing system for perforated sprinkler pans consisting of a header box adapted to be disposed over a sprinkler pan intermediate its ends and to which liquid is supplied, the box having openings in the walls thereof for directing liquid toward both ends of the pan, and having an adjustably tiltable floor whereby to regulate the size and contour of the openings, the floor having adjustable openings for supplying liquid to the portion of the pan directly below it.

3,777,989

DISHWASHER WITH CYCLE TIMING SYSTEM

Gerald M. Pucella, 100 Pennypacker Dr., Willingboro, N.J., and Richard S. Eckman, 448D Garnet Mine Rd., Boothwyn, Pa.

Filed Apr. 14, 1972, Ser. No. 244,114
Int. Cl. B05b 1/18
U.S. Cl. 239—567 22 Claims



A cycle timing system for dishwasher apparatus controls the fill and drain sequence. A control shaft is manually rotated to wind a torsion spring and bias the control shaft for rotation in a first direction. This rotation is inhibited by a pair of detent arms which are biased towards a ratchet wheel mounted on the control shaft. Each detent arm is adapted to engage a tooth of the ratchet wheel, one arm being midway between a pair of adjacent teeth of the ratchet wheel when the other detent arm is engaged with a tooth of the ratchet wheel and vice versa. A float, which senses the level of water in the tube of the dishwasher apparatus, is mounted on a pivoted float arm which rotates a float arm rod having a float arm rod extension adapted to push one detent arm from the rachet wheel when the water level in the tub reaches a predetermined high level and to push the other detent arm from the ratchet wheel when the water level in the tub reaches a predetermined low level. When a detent arm is pushed from a tooth of the ratchet wheel, the control shaft is free to rotate in the first direction until a tooth of the ratchet wheel is engaged by the other detent arm. A control cam is mounted on the control shaft and actuates a valve control switch causing a valve to assume a fill or a drain position. The dishwasher includes a sprayer formed by a channel integral with the bottom wall of the tub and covered by a cover plate having a plurality of spray orifices.

3,777,990

VALVED NOZZLE FOR AN INJECTION MOLDING MACHINE

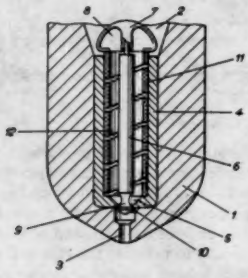
Kurt Herzog, Wilketstrasse 186, Degersheim, Switzerland

Filed Apr. 14, 1972, Ser. No. 244,150

Claims priority, application Switzerland, Apr. 20, 1971, 5743/71; Aug. 9, 1971, 11698/71

Int. Cl. B05b *1/30*

U.S. Cl. 239—571 6 Claims



The restricted discharge orifice in a nozzle for an injection molding machine is normally held closed by a valve member in the nozzle bore which engages a valve seat in the bore contiguously adjacent the orifice. The valve member is biased toward the closed position by a helical compression spring in the nozzle bore. The spring is a metal strip of rectangular cross section whose narrow edges bound the steeply helical gap separating the spring turns. The valve is opened by the pressure of the molten plastic when used on a screw-type injection machine, or by engagement of the mold with an abutment projecting from the valve member outward of the nozzle orifice in the closed position of the valve, when the nozzle is used on a plunger-type molding machine.

3,777,991

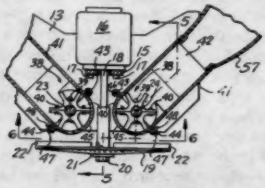
LAWN TREATING MACHINE

Robert Picardat, 7712 Ridgecrest Dr., Alexandria, Va.

Filed Feb. 11, 1972, Ser. No. 225,556

Int. Cl. A01c *19/00*

U.S. Cl. 239—656 9 Claims



A lawn treating machine mounted on and driven by a garden tractor and including a scattering mechanism for scattering lawn treating materials carried in hoppers supported on the tractor. The scattering mechanism includes a generally horizontal rotatable disc and rotating feed elements which feed material from the hoppers to the disc.

3,777,992

SPREADER

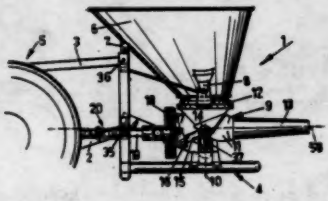
Cornelis J. de Koning, Nieuw-Vennep, Netherlands, assignor to H. Vissers N.V., Nieuw-Vennep, Netherlands

Filed Dec. 3, 1971, Ser. No. 204,445

Claims priority, application Netherlands, Dec. 8, 1970, 7017863

Int. Cl. A01c *3/06*; E01c *19/20*

U.S. Cl. 239—689 5 Claims



A spreader, e.g. fertilizer, comprises an oscillating spreading mechanism, owing to which the spreader as well as the towing vehicle are subject to considerable oscillating movements, causing much wear to said spreader and vehicle and worrying the human driver. The spreader according to the invention is more quiet and/or can spread fertilizer over a considerably larger width, in that compensation mass for damping movements is supported by the frame of the spreader.

3,777,993

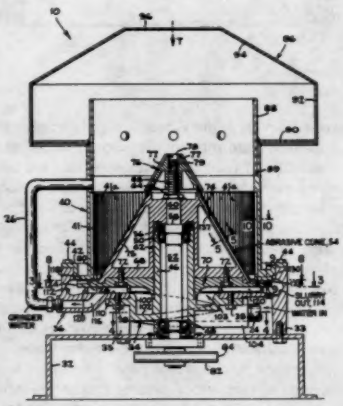
METHOD AND APPARATUS FOR COMMINUTING

Richard N. Crandall, 17792 Lewis Dr., Huntington Beach, Calif.

Filed Nov. 8, 1971, Ser. No. 196,421

Int. Cl. B02c *18/40*

U.S. Cl. 241—15 14 Claims



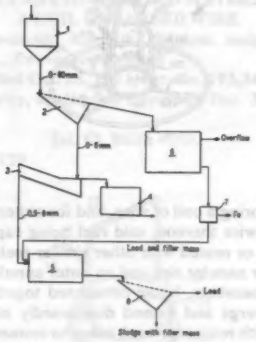
A trash grinder has a chamber with a fixed cylindrical wall containing a rotatable abrasive cone with a water impeller under the base of the cone. Water is admitted to the impeller and to the grinding chamber along with trash. The trash forms a frusto-conical mass which rotates about its own axis and about the axis of the cone and works its way down the chamber under the force of gravity. The inertia of the mass causes relative grinding motion of the mass and discrete grinding elements of the cone which reduces the mass into fine particles that form a slurry along with the water, which slurry is ejected by the impeller. The slurry can be used for disposal in a sewage system.

3,777,994

RECOVERY OF LEAD FROM ACCUMULATOR SCRAP

Rudolf Fischer, Cologne, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany

Filed Jan. 26, 1972, Ser. No. 221,042
Claims priority, application Germany, Jan. 29, 1971, P 21 04 130.5
Int. Cl. B02c 21/00
U.S. Cl. 241—24 3 Claims



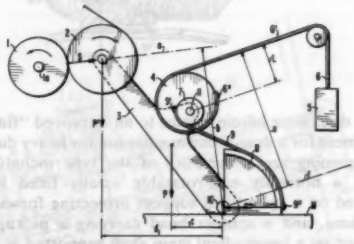
Lead accumulators or used storage batteries are coarsely ground into pieces in an impact crusher and the fine material containing metallic lead is separated and ground again and then classified. The remaining part of the coarsely ground material is subjected to a sink-flotation-separation and the fine material recovered as a sludge is introduced into a tubular vibrating mill filled with grinding bodies and ground therein, whereupon the ground material is screened and classified to recover the lead therein.

3,777,995

THREAD WINDING DEVICE

Ettore Funaioli, Bologna; Piercarlo Landini, Busto Arsizio, and Giulio Marella, Palazzolo Sull Oglio, all of Italy, assignors to Societa'Italiana Resine S.p.A., Milan, Italy

Filed July 1, 1971, Ser. No. 158,825
Claims priority, application Italy, July 1, 1970, 26847 A/70
Int. Cl. B65h 54/02, 54/42
U.S. Cl. 242—18 DD 1 Claim



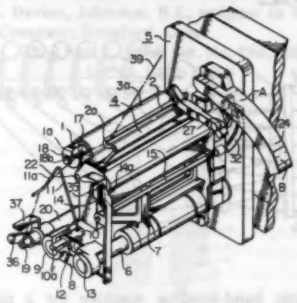
In apparatus for the winding of continuous thread, the tension of the thread is maintained constant during winding by an arrangement adapted to regulate the contact force between the roller and the reel, such regulation taking place as a function of the diameter of the reel while it is being wound.

3,777,996

BOBBIN EXCHANGE MECHANISM OF A YARN WINDER

Soichi Torii, 28, Shichiku Umenokicho, Kita-ku, Kyoto, Japan

Filed Oct. 1, 1971, Ser. No. 185,673
Claims priority, application Japan, May 9, 1971, 46/33737
Int. Cl. B65h 54/02
U.S. Cl. 242—18 R 4 Claims



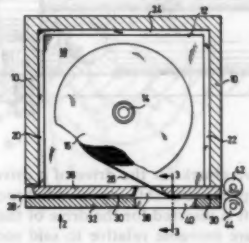
An improved bobbin exchange mechanism of a yarn winder, particularly a device for catching an end of supplied yarn upon a fresh bare bobbin after doffing a full packaged bobbin and mounting a fresh bare bobbin upon a winding mechanism of a yarn winder.

3,777,997

APPARATUS FOR APPLYING FILMED IMAGES TO PUNCHED CARDS AND COMPONENTS FOR SUCH APPARATUS

Franz Spiroch, Coburg, and Heinz G. Ostwald, Frankfurt, both of Germany, assignors to Eichner Organisation KG, Coburg, Germany

Filed Oct. 21, 1971, Ser. No. 191,325
Claims priority, application Germany, Oct. 29, 1970, P 20 53 035.2
Int. Cl. B65h 19/02
U.S. Cl. 242—55.53 1 Claim



A cassette for holding a spool or strip of film for use with apparatus for applying images on the film separately to punched cards. The cassette has a spool holder and its own film guide consisting of a slot located between the front wall of the cassette and a guide part. Film from a spool is fed into the slot via an opening in the front wall.

3,777,998

AUTOMATIC BAND-WINDING MACHINE

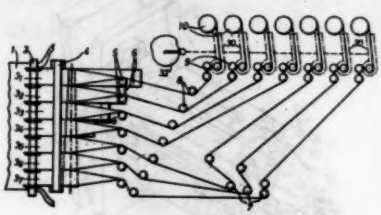
Willi Jores, Opladen; Franz Hoffacker, Langenfeld; Bernhardt Kreit; Helmut Lehmann, both of Leverkusen, and Herbert Hardenbicker, Bergisch Gladbach, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 10, 1972, Ser. No. 225,154

Claims priority, application Germany, Feb. 13, 1971, P 21 06 865.5

Int. Cl. B65h *35/02, 19/26*

U.S. Cl. 242—56.2 11 Claims



An automatic band-winding machine for a plurality of bands comprises winding heads, threading units having cutting blades, prewinding mechanisms, a band-deflecting station and a conveyor belt for carrying away the ready rolls. The winding heads, which are adapted to be driven through bevel gears and friction clutches are arranged opposite one another in one plane about a horizontal axis and are rotatable about this axis through 180°. Gravity clutches are provided for so that only the winding heads above the horizontal plane through the common axis are connected to the drive.

3,777,999

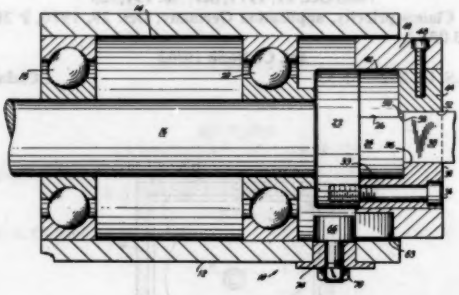
SAFETY DRIVE CHUCK

Joseph Sciola, Upper Saddle River, and Gabor Nagy, Clifton, both of N.J., assignors to Super Chuck Company, Inc., Paterson, N.J.

Filed Nov. 12, 1971, Ser. No. 198,169

Int. Cl. B65h *19/00*

U.S. Cl. 242—68.4 5 Claims



A safety drive chuck for the drive of a driven shaft is provided and comprises rotatable, open-ended socket means into which said shaft is inserted for the drive of the latter, locking means which are movable relative to said socket between a first position wherein said locking means close said socket to prevent the falling of said shaft therefrom, and a second position wherein said socket is opened to permit the removal of said shaft therefrom, and positioning means which are operable to enable movement of said locking means into said second position only when said socket is in the single position thereof which prevents the falling of said drive shaft therefrom.

3,778,000

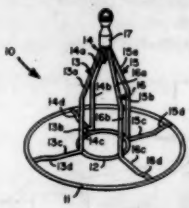
ROTATABLE REEL

James H. Breuner, 1226 Broadway, and Clarence E. Stumpf, Jr., 2255 Brommer St., both of Santa Cruz, Calif.

Filed July 26, 1972, Ser. No. 275,309

Int. Cl. B65h *75/20*

U.S. Cl. 242—77.2 8 Claims



A reel for storing a coil of wire, and for either unwinding or rewinding the wire thereon, said reel being capable of being stacked within or nested with other similar reels. The reel includes an inner annular rim and an outer annular rim. A plurality of rod members, being connected together at one of their ends, diverge and extend downwardly at substantially equal angles with respect to each other to connect to the inner annular rim, and then extend outwardly and upwardly to connect at their other ends to the outer annular rim, thereby forming a core frame and a base frame. The reel includes a rotatable suspension connector having a reel holder and a holder shaft to enable the reel to be easily suspended and to be freely rotated when desired.

3,778,001

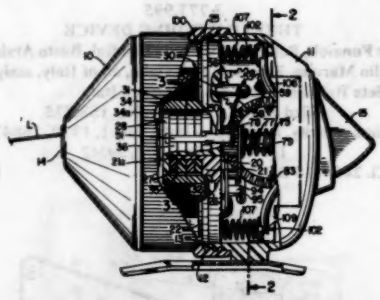
SPINNING REEL

R. Dell Hull, 6101 E. Apache St., Tulsa, Okla.

Filed Jan. 26, 1972, Ser. No. 220,755

Int. Cl. A01k *89/02*

U.S. Cl. 242—84.5 A 10 Claims



The disclosure herein relates to an improved "fine tuning" adjustment for a drag brake mechanism for heavy duty, closed face spinning reel assemblies of the type including a reel frame, a normally non-rotatable axially fixed line spool mounted on a cylindrical support projecting forwardly from the frame, and a spinner head carrying a pickup element mounted on a longitudinal main shaft supported in the frame for rotation about and displacement along a predetermined axis. Selectively predetermined, limited "drag" or rotation of the spool about its cylindrical support is accommodated through the controlled expansion and contraction of a series of split clutch rings. More specifically, the clutch rings are effectively increased in diameter by an eccentric cam actuator disposed between the split surfaces of the clutch rings, which

actuator itself is uniquely, finely adjusted by a control member at the crank lever through means of a unique arrangement which applies the displacement of a jack screw to the eccentric actuator through a coil spring and lever arm mechanism. The jack screw is actuated through a two-gear train controlled by a star wheel supported on the reel crankshaft, adjacent the reel crank lever. The crankshaft, itself, drives the main shaft through appropriate gearing.

3,778,002

DEVICE FOR CARRYING COILED MATERIAL SUCH AS A COIL OF BARBED WIRE

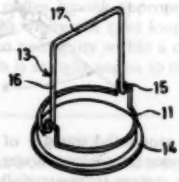
Fernand Alleweireldt, Kortrijk, Belgium, assignor to N. V. Bekaert S.A., Zwevegem, Belgium

Filed Oct. 28, 1971, Ser. No. 193,346

Claims priority, application Germany, Dec. 31, 1970, P 20 64 648.4

Int. Cl. B65h *49/00*

U.S. Cl. 242—129 **7 Claims**



A device adapted to carry a coil of wire or the like includes a cylindrical ring having an outside diameter about the same as the inside diameter desired for the coiled material, at least one radial projection extending outwardly from one end of the ring a distance sufficient to support the coil thereon, and a handle connected to the ring and adapted to carry the device and the coiled material thereon. The device is particularly effective for carrying coils of barbed wire. Despite the fact that only a fraction of a coil of barbed wire is supported directly by the cylindrical ring and radial projection, the layers of the coil do not sag because of their mutual coherence and adequately support the coil. In producing the coiled material the device may be mounted on the winding mandrel of a winding machine.

3,778,003

SPOOLING DEVICE FOR UNWINDING WIRE

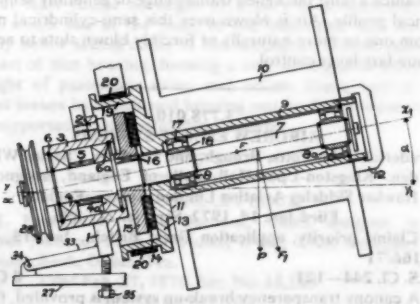
Jean Godderidge, 11, Boulevard Henri Barbusse, Houilles, France

Filed Aug. 12, 1971, Ser. No. 171,112

Claims priority, application France, Jan. 15, 1971, 7101364

Int. Cl. B65h *59/38*

U.S. Cl. 242—156 **5 Claims**



In a spooling device for unwinding thin wire a bobbin is arranged on a hub mounted in free rotation and capable of sliding over a support shaft, the longitudinal axis of which is inclined by an adjustable angle α with respect to the horizontal, the said support shaft being driven in rotation and being integral with a friction disc against which one face of the hub bears by means of a friction packing, under the action of a force F. The invention is of particular value in wire-drawing for unwinding thin wire from a large bobbin.

3,778,004

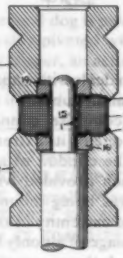
DISPOSABLE SEWING MACHINE BOBBIN

Howard E. Devine, Johnston, R.I., assignor to The American Thread Company, Stamford, Conn.

Filed Nov. 1, 1971, Ser. No. 194,240

Int. Cl. B65h *55/00*

U.S. Cl. 242—169 **5 Claims**



An improved prewound disposable sewing machine bobbin has a plastic core tube for superior strength and dimensional stability. The ends of the core tube are reduced in wall thickness, preferably by internal beveling, before assembly, thereby providing better crimping and reduced thread breakage during bobbin assembly.

3,778,005

MECHANISM FOR HANDLING MAGNETIC TAPES

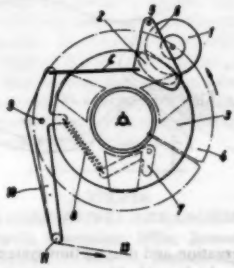
Fritz Gruniger, Stockheim; Gunther Muller, Wilhelmsthal, and Klaus Steiger, Kronach, all of Germany, assignors to Loewe-Opta GmbH, Berlin, Germany

Filed Jan. 5, 1972, Ser. No. 215,609

Claims priority, application Germany, Jan. 7, 1970, G 71 00 448.3; Jan. 7, 1970, G 71 00 449.4; Jan. 7, 1970, G 71 00 447.2

Int. Cl. B65h *59/00*; G03b *1/04*; G11b *15/32*

U.S. Cl. 242—186 **14 Claims**



Mechanism for selectively pulling the tape of a tape recorder forwardly or retarding the tape as required to maintain the tape under constant tension. A means for scanning tape tension controls the air gap of a magnetic eddy current coupling interposed between a constant speed driving means and an eddy current disc drivingly connected to a tape spool.

3,778,006

CONVEYING INSTALLATIONS USING PNEUMATIC TUBES

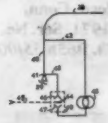
Rene Jean Martin, Villeneuve-La-Garenne, France, assignor to Societe Francaise Des Tubes Pneumatiques, Haute de Seine, France

Filed Apr. 17, 1972, Ser. No. 244,655

Claims priority, application France, June 30, 1971, 7124015

Int. Cl. B65g *51/32*

U.S. Cl. 243—19 **2 Claims**



The present invention deals with improvements to conveyor installations using pneumatic tubes.

Said improvements comprise connecting the pneumatic tube element closed at one of its extremities is a dispatching-receiving station with the conduit of a pumping machine by means of two pipes each provided with a one-way floating clapper-valve, said valves being mounted in opposition, the pipe closer to the closed extremity of the pneumatic tube element permitting the passage of air only from the conduit of the pumping machine towards the pneumatic tube.

This improvement is particularly simple, effective and reliable for conveyor installations provided with a single pneumatic tube connecting different dispatching-receiving stations.

3,778,007

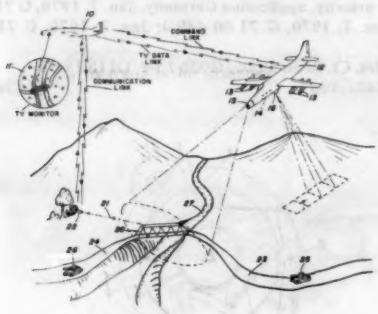
ROD TELEVISION-GUIDED DRONE TO PERFORM RECONNAISSANCE AND ORDNANCE DELIVERY

Stuart D. Kearney, II, Bethesda, Md., and Walter Richardson, Ventura, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 8, 1972, Ser. No. 252,931

Int. Cl. F41g *7/10*

U.S. Cl. 244—3.14 **10 Claims**



A remote observation and destruction system comprises an unmanned flight vehicle guided by a remote operator viewing a television display to perform reconnaissance and the delivery of naval ordnance. A television camera is mounted on the unmanned flight vehicle and the television picture is transmitted to a television monitor in a remote control station. The remote operator controls the flight vehicle on the basis of the information contained in the television picture. A hand held laser aimed at the target by a forward observer can be used to point out concealed targets.

3,778,008

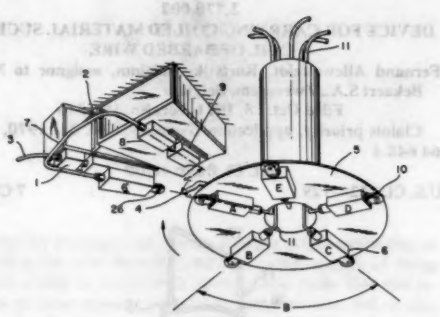
SYSTEM FOR INITIATING ORDNANCE DEVICES MOUNTED UPON A ROTATING PLATE

Robert W. Ingham, and Milton W. Chambers, both of Hollister, Calif., assignors to Teledyne McCormick Selph, Hollister, Calif.

Filed Feb. 16, 1972, Ser. No. 226,878

Int. Cl. B64c *27/00*

U.S. Cl. 244—17.11 **15 Claims**



A system for the sequential transfer of lineal mechanical force to initiate ordnace detonators mounted upon a rotating plate, for example a system to sequentially detonate for the purpose of severing helicopter blades, so as to enable helicopter pilot ejection under emergency conditions.

3,778,009

AERODYNAMIC SURFACES

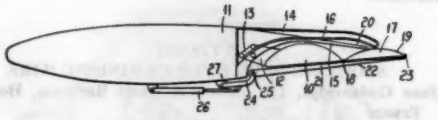
Peter Killcross Jones, Macclesfield, England, assignor to Hawker Siddeley Aviation Limited, Surrey, England

Filed June 23, 1971, Ser. No. 155,704

Claims priority, application Great Britain, June 23, 1970, 30,512/70

Int. Cl. B64c *3/56, 9/18*

U.S. Cl. 244—42 DA **11 Claims**



A high lift device at the trailing edge of an aircraft wing, consisting of members that can be extended or inflated to produce a bluff thickened trailing edge of generally semicylindrical profile. Air is blown over this semi-cylindrical profile from one or more naturally or forcibly blown slots to achieve boundary layer control.

3,778,010

AIRCREW ESCAPE SYSTEMS

Frederick John Potts, Brough, and Geoffrey Charles Wickenden, Kingston-Upon-Hull, both of England, assignors to Hawker Siddeley Aviation Limited, Surrey, England

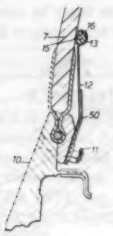
Filed Jan. 14, 1972, Ser. No. 217,896

Claims priority, application Great Britain, Jan. 15, 1971, 2,166/71

U.S. Cl. 244—121 **8 Claims**

A canopy transparency break-up system is provided, for use in emergency escape from an aircraft through the cockpit canopy, in which miniature detonating cord (MDC) is held in place around the periphery of the transparency, or a selected

area of the transparency, and is formed into loops at intervals which loops act as crack iniators when the cord is detonated. The cord is clamped in place, without adhesive, by means of retaining plates of springy steel which are bolted to the canopy frame and are segmented by transverse slots at intervals along



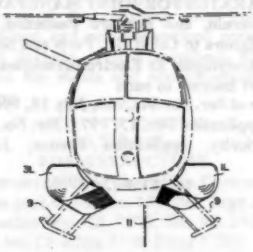
their lengths, these plates having appropriate extensions or tongues in the regions where the cord loops occur. The cord ends are brought into contiguity within a common detonator unit the axis of which is at right angles to the axes of the cord ends.

3,778,011

HELICOPTER CARGO POD

Corbitt Thomas Cannon, 109 Daniel St., Arnprior, Ontario, Canada

Filed Jan. 11, 1972, Ser. No. 216,961
Claims priority, application Canada, Nov. 9, 1971, 127,210
Int. Cl. B64d *9/00*
U.S. Cl. 244—137 R **4 Claims**



A cargo pod suitable for attachment to a passenger helicopter comprises: a faired housing forming an elongated box; a contoured inward side to the housing, shaped to fit closely at least round its edges to a part of a helicopter fuselage which lies at the sides of the helicopter and immediately below access doors of the helicopter; a reinforced upper part of that housing, forming a step arranged to carry the weight of passengers using said access doors; and attachment means by which said housing can be firmly secured to, and supported by, the helicopter fuselage.

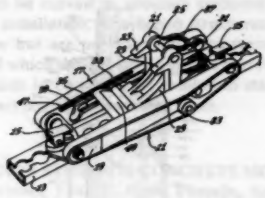
3,778,012

AUTOMATIC PALLET LOCK

Reuel J. Fernandez, Santa Barbara, Calif., assignor to Republic National Bank of Dallas; Irving Trust Company and Union Bank, Dallas, Tex.

Filed Feb. 27, 1970, Ser. No. 15,125
Int. Cl. B65g *1/00*
U.S. Cl. 248—119 R **12 Claims**

A pallet lock, for use in aircraft or other carriers, having two locking dogs which are movable between unlocked positions within a frame and locking positions above the frame. A first locking dog is fixedly pivoted to the frame and is partially actuated by a trigger lever which is tripped by a first pallet and acts thrc·.gh a spring to move the free end of the dog toward



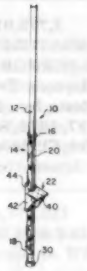
the locking position. A second dog is pivoted to the free end of the first dog and is movably pivoted within the frame. If the first pallet stops over the trigger, an actuating lever, indirectly pivoted to the second dog, is moved by a second pallet to force the first and second dogs into the pallet-locking position.

3,778,013

ADJUSTABLE SUPPORT

Albert A. Selenke, 1302 S. Magnolia Way, Denver, Colo.

Filed July 27, 1972, Ser. No. 275,629
Int. Cl. E04b *2/78*
U.S. Cl. 248—221 **15 Claims**



An adjustable support for positive suspension of articles such as brackets, steps, partition walls and the like comprises an elongated rigid rod having flexible straps or cables of inextensible material wrapped at least partially therearound so as to converge at spaced intervals to define reinforcing areas. The straps at reinforcing areas define suspension locations at which reinforcing clips are retained in vertically spaced positions along the length of the rod. The bracket or other object oeing suspended from the support includes a downwardly projecting finger insertable vertically into limited space formed between the clips and the outer surface of the rod to positively retain the article in a selected position.

3,778,014

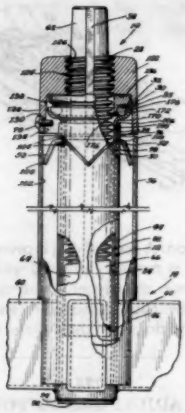
CHAIR BASE SWIVEL ARRANGEMENT

Richard P. Driscoll, Clarendon Hills; James W. Lannert, Oswego, and Donald V. Beaver, Brookfield, all of Ill., assignors to All-Steel Equipment Inc., Aurora, Ill.

Filed July 26, 1971, Ser. No. 166,099
Int. Cl. F16m *11/00, 13/00*
U.S. Cl. 248—406 **8 Claims**

A chair base swivel arrangement comprising a tubular member supported in upright position from a chair base and carrying at its upper end an axially split O-shaped bearing element of antifriction material that is engaged by a sintered swivel member on which the chair base nut or hand wheel

rests. The bearing element seats of the tubular member and swivel member are of complemental semi-torus configuration relative to the bearing element peripheral surface, with the tu-



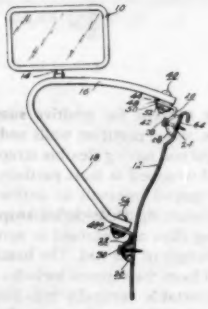
bular member seat engaging the lower radially outer quadrant of the bearing element and the swivel member seat engaging the upper radially inner quadrant of the bearing element.

3,778,015

METHOD AND APPARATUS FOR THE MOUNTING OF VEHICLE-MIRROR ASSEMBLIES

James W. Holzman, Haycock Twp., Bucks County, Pa., assignor to Delbar Products, Inc., Perkasie, Pa.

Filed July 17, 1972, Ser. No. 272,123
Int. Cl. B60r 1/06
U.S. Cl. 248—475 R **10 Claims**



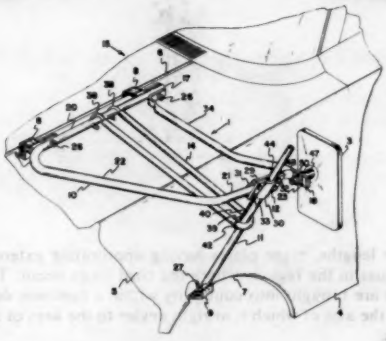
A vehicle-mirror is mounted to the exterior of a vehicle body by providing on each selected mounting area of the vehicle body an adapter member presenting a cylindrical surface against which a corresponding cylindrical surface of a mirror-supporting articulating member is positioned in angularly adjustable mating relation. The adapter member and the articulating member are secured to each other and to the vehicle body by a fastener, such as a self-tapping screw, extending through a slot in one member and a bore in the other member; a pilot hole may be made in the vehicle body for the fastener by applying a drill through the slot and bore combination with the articulating member and the adapter member in their selected mating positions. In this way a secure flush mounting is obtained for any of a variety of contours of vehicle surfaces.

3,778,016

ARTICLE MOUNT

Paul D. Gernhardt, Raytown, Mo., and Charles A. Slater, Jr., Overland Park, Kans., assignors to Peterson Manufacturing Company, Grandview, Mo.

Filed Oct. 24, 1972, Ser. No. 299,796
Int. Cl. B60r 1/06
U.S. Cl. 248—475 R **11 Claims**



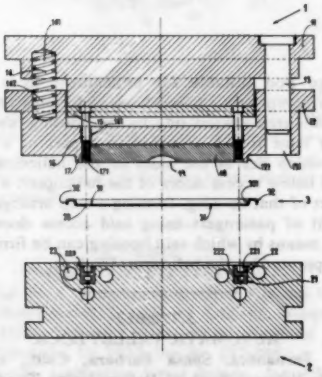
A rear view mirror support having a mounting structure for supporting a rear view mirror in spaced relation from a vehicle front fender. The mounting structure is comprised of arm members connected together and having mounting members secured to same for engaging portions of a vehicle front fender. A tensioning member is secured to and extends between the arm members for holding the mounting members in engagement with the fender by applying force to the arms.

3,778,017

APPARATUS FOR JOINT MANUFACTURE

Jacques Doucerain, and Bernard Baumann, both of Paris, France, assignors to Cebal GP, Paris and Societe De Traitements Electrolytiques Et Electrothermiques, Massy, both of France, part interest to each

Continuation of Ser. No. 842,968, July 18, 1969, abandoned.
This application Dec. 13, 1971, Ser. No. 207,696
Claims priority, application France, July 23, 1968, 68160224
Int. Cl. B22d 27/02
U.S. Cl. 249—78 **9 Claims**



A plastic joint and apparatus for its manufacture which includes a first molding portion comprising a base supporting a body which can be displaced relative to said base, spring means biasing the body against the base and molding means being movable with respect to the base in response to dis-

placement of the body, and a second molding portion comprising a base plate having a molding groove carrying a channel member of an electrically conductive material and induction heating means to heat the channel member to reduce a blank of a thermoplastic material contained therein, whereby the thermoplastic material is displaced between a gap between sheets of a rigid material to form a continuous closed joint body between the sheets of rigid material, the edges of the sheets being in molded engagement in continuous grooves in the joint body.

3,778,018

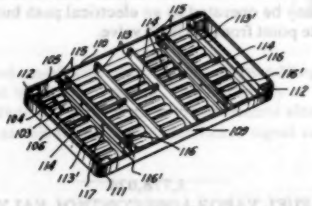
MOLD STRUCTURE

Juan Manuel Abalo, Buenos Aires, Argentina, assignor to Noel Y Compania Limitada Sociedad Anonima Argentina de Dulces Y Conservas, Buenos Aires, Argentina

Filed July 22, 1971, Ser. No. 165,065

Int. Cl. A23g *1/22*

U.S. Cl. 249—120 **8 Claims**



Molds used for producing foamed chocolate are subject to wear and impacts by conveyors and therefore must be provided with reinforcing means including corner reinforcing members and a grid rib arrangement below the molding cavities, said grid rib also providing rails for sliding the molds along a runway, and the conveyor must guide the molds through pressurized and non-pressurized zones, so that the conveyor must include sealing members which are also adapted to push the molds and simultaneously provide the necessary sealing.

3,778,019

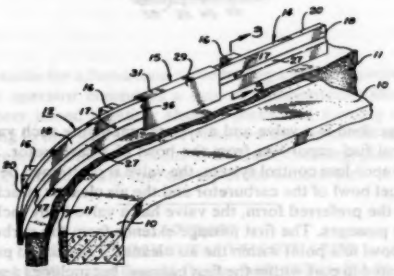
FORM STRUCTURE

William J. Stegmeier, 1021 C Shary Cir., Concord, Calif.

Continuation-in-part of Ser. No. 154,290, June 18, 1971. This application Sept. 25, 1972, Ser. No. 292,073

Int. Cl. B28b *7/06*; E04g *17/02*

U.S. Cl. 249—189 **2 Claims**



Form structure for use in pouring the concrete deck for a swimming pool. The form structure includes a plurality of elongated board structures and one or more generally tubular connector structures each of which is hollow from end-to-end thereof and dimensioned to removably receive the end portions of two successive board structures inserted thereinto from opposite directions. The extent to which such board structures are insertable into the connector is defined by stop means projecting into the interior of the connector, and the boards are tightly held by frictional gripping means able to accommodate boards of various thickness while preventing sagging thereof. The board structures have sufficient flexibility in the longitudinal direction to permit mold forms comprising the same to be curved to accurate contours required by any particular installation. The board structures are also essentially hollow but are provided with transversely oriented webs certain of which define nailing spaces therebetween that permit the boards to be removably nailed to stakes or other support members provided for this purpose.

3,778,020

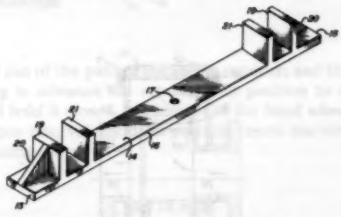
FOUNDATION STRIP FOR CONCRETE MOLDING

Charles B. Burrows, 1142 E. Ruth, Phoenix, Ariz., and Edward A. Vajda, 8551 E. Thornwood Dr., Scottsdale, Ariz.

Filed Mar. 9, 1972, Ser. No. 233,207

Int. Cl. E04g *17/06*

U.S. Cl. 249—219 R **2 Claims**



This specification discloses a foundation strip that is used to locate two vertical mold panels in spaced relation on a base and maintain the panels in these positions during the molding of a concrete wall. The strip is an integral one-piece member of plastic and is structurally designed to incorporate the necessary properties of strength and rigidity into the strip when made of plastic, as compared to metal.

3,778,021

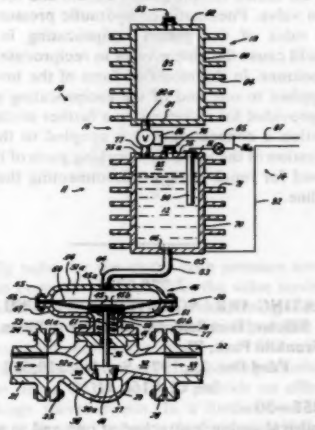
POWER SYSTEMS FOR VALVE SYSTEMS

Joe K. Alexander, and Donald D. Williams, both of Box 92, Friendswood, Tex.

Continuation of Ser. No. 84,255, July 17, 1969, abandoned. This application Feb. 19, 1971, Ser. No. 117,100

Int. Cl. G05d *7/06*; F03g *7/06*; F16k *31/02*

U.S. Cl. 251—11 **8 Claims**



A closed, self-sustaining power system for the operation of valves includes a first means for storing and containing an ex-

pandable system which means communicates with a responsive means of a valve system to enable the valve system to be opened, closed or controlled. A controlled energy means transmits energy to the expandable medium to thereby cause an increase in pressure in the responsive means of the valve system which enables the valve system to respond as desired. After actuation of the responsive means of the valve system, the means for storing is enabled to communicate with a reservoir means which thereby increases the area of the closed system to reduce the pressure in the closed system sufficiently to terminate actuation of the responsive means of the valve system.

3,778,022

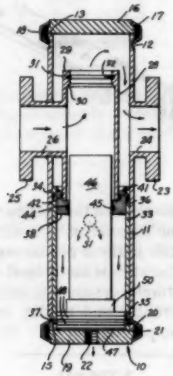
VALVE

Raymond Yauneridge, 605 Cherry St., Windber, Pa.

Filed Jan. 27, 1972, Ser. No. 221,331

Int. Cl. F16k *31/143, 1/00*

U.S. Cl. 251—14 **7 Claims**



A valve in which a piston plug moving through a cylinder engages a seal at one end of the cylinder to prevent the flow of fluid therethrough. The opposite end of the piston is also sealed to the cylinder to prevent leakage. A cylindrical sleeve is sealed into the valve body and has an enlarged piston mounted for sealed reciprocation therein and forming part of the piston valve. Pneumatic or hydraulic pressure applied to opposite sides of the piston reciprocating in the sleeve cylinder will cause the piston valve to reciprocate to open and closed positions. In the modified form of the invention pressure is applied to one end of the reciprocating piston and a spring is provided for its return. In a further modified form of the invention a connecting rod is coupled to the piston for hand operation of the valve. All working parts of the valve can be removed for repair without disconnecting the valve body from the line.

3,778,023

OPERATING ARRANGEMENT FOR FLUSH VALVES

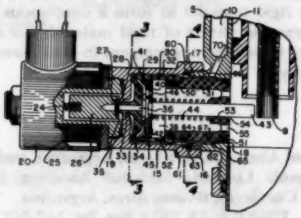
Henry R. Billeter, Deerfield, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed Dec. 22, 1971, Ser. No. 210,652

Int. Cl. F16k *31/10*

U.S. Cl. 251—30 **5 Claims**

A cylindrical casing is attached at one end to a flush valve and at the other end supports an electric solenoid. Connecting fluid flow passages in the flush valve body and through the length of the casing lead to the solenoid valve seat. A piston in the casing is operated by hydraulic pressure through the fluid passages when the solenoid is operated. This action projects a



plunger forward into the flush valve to cause it to operate. The solenoid may be operated by an electrical push button located at a remote point from the flush valve.

3,778,024

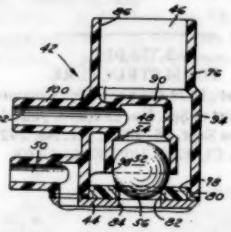
FUEL VAPOR-LOSS CONTROL VALVE

Jerry B. Rogerson, Taylor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 21, 1971, Ser. No. 191,266

Int. Cl. F02m *19/00, 27/00*

U.S. Cl. 251—63 **1 Claim**



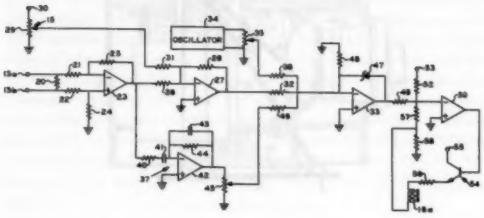
Described is a valve and a system employing such valve to control fuel vapor-loss from the bowl of a carburetor. In the fuel vapor-loss control system, the valve is positioned between the fuel bowl of the carburetor and the air cleaner attached to it. In the preferred form, the valve has a valve body including three passages. The first passage extends from the carburetor fuel bowl to a point within the air cleaner. The second passage is located in part within the first passage, but includes a second part extending to a point outside of the first passage. A third passage is connected with the carburetor fuel bowl and with a canister for the storage of fuel vapor. The second passage in the valve body has a movable member for preventing flow of vapor from the fuel bowl of the carburetor to the air cleaner when the movable member is in contact with a valve seat. Movement of the movable member is controlled by engine manifold vacuum attached to one end of the second passage in the valve body.

3,778,025

MODIFIED ON-OFF CONTROL

Donald W. Lane, Boothwyn, Pa., and Troy J. Pemberton, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 48,343, June 22, 1970, Pat. No. 3,676,782.
This application Mar. 29, 1972, Ser. No. 239,052
Int. Cl. F16k *31/06*; G05b *11/10*, *11/38*
U.S. Cl. 251—129 5 Claims



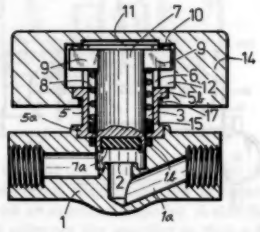
A modified on-off controller is formed by adding an alternating signal to the error signal. The frequency of the added signal is sufficiently high to prevent the control element from responding at this frequency. A derivative signal can also be added.

3,778,026

HANDLE FOR FAST-ACTION VALVE

Philipp Kreis, Neumarkterstr. 34-36, Munich, Germany

Filed Dec. 3, 1971, Ser. No. 204,453
Claims priority, application Germany, Mar. 26, 1971, P 21 14 847.0
Int. Cl. F16k *31/60*
U.S. Cl. 251—255 9 Claims



A handle for a fast-action valve having a laterally projecting rotary operator comprises a pair of symmetrically identical members joined together along a plane and forming cavity opening in line with the plane. The two handle halves may be connected together by means of adhesive bonding, pins, snap rigs, keys fitted axially into the top of the handle, etc.

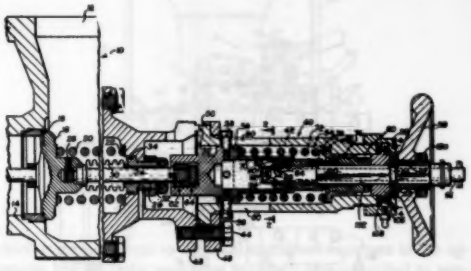
3,778,027

QUICK CLOSING VALVE ACTUATOR

Richard Collins, and Donald Denise, both of Denville, N.J., assignors to Marotta Scientific Controls, Inc., Boonton, N.J.

Filed Sept. 25, 1972, Ser. No. 292,265
Int. Cl. F16k *31/56*
U.S. Cl. 251—297 16 Claims

This valve is opened against the force of a spring by motion-transmitting means operated by a hand wheel or other conventional valve-operating mechanism. The invention provides quick release mechanism between the valve and hand wheel to release the valve from its connection with the hand wheel so that the spring can cause instantaneous closing of the valve. In the preferred construction, balls extending into the path of a spring retainer hold the spring under the load imparted to it by the hand wheel or other hand-operating mechanism. A release pin moves a groove under the balls so that they can move inward and out of the path of the spring retainer; and this causes the spring to advance the retainer into position to close the valve and hold it closed. Movement of the hand wheel and its connections into valve closed position resets the mechanism for reopening the valve.

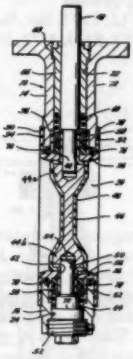


3,778,028

LINED BUTTERFLY VALVE

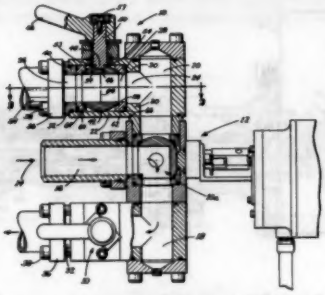
Gail W. Graves, Richmond; Gerald R. Pope; Joseph T. Stewart, Jr., both of Houston, and Willard L. Petrosky, Alief, all of Tex., assignors to John L. Dore' Co., Houston, Tex.

Filed Aug. 2, 1972, Ser. No. 277,404
Int. Cl. F16k *1/226*
U.S. Cl. 251—306 18 Claims



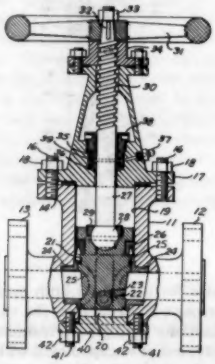
A butterfly valve for use under both pressure and vacuum conditions in corrosive fluid service, the valve having a body member, a substantially rigid plastic resin lining seated within a bore of the body, a disc encapsulated with plastic resin and pivotally mounted within the bore, and first and second packing means disposed between supporting members of the disc and the lining of the body to provide an effective seal against leakage therebetween. In a further embodiment, a resilient seat is disposed between the lining and body member to yieldably urge the lining into engagement with the disc for more positive closure of the disc relative to the body and the lining.

3,778,029
BALL VALVE
William J. Baker, Orange, Calif., assignor to Armco Steel Corporation, Middletown, Ohio
Filed Nov. 22, 1972, Ser. No. 308,686
Int. Cl. F16k 5/06
U.S. Cl. 251—315 18 Claims



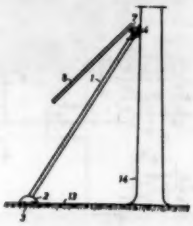
A ball valve which achieves a bubble-tight low pressure seal by a slight interference fit between the valve seats and the ball. The valve seats are precluded from blowing out when the valve is opening to flow with a high pressure differential thereacross by a relief groove and associated apertures in each of the seat carriers which permit the first flow of fluid to bypass around and behind the upstream seat through the holes in the associated seat carrier.

3,778,030
GATE VALVE
Bernard Carlin, Orange, Tex., assignor to Billy J. Garrett, Orange, N.J., a part interest
Filed Oct. 12, 1971, Ser. No. 188,192
Int. Cl. F16k 3/22, 3/316
U.S. Cl. 251—327 2 Claims



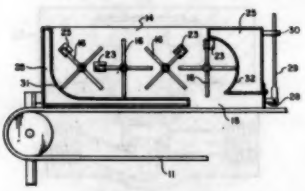
A gate valve having a rising stem actuator sealed with pressure grease retainers and a pressure fitting on the valve. A cross member in the valve body extends through a slot in the gate valve piston to prevent the piston from rotating with respect to the valve stem and valve body.

3,778,031
TREE FELLING GUIDER
Per Henry Enander, Svedbro, Gnarp, Sweden, assignor to Skogsdon Aktiebolag, Stockholm, Sweden
Filed Mar. 16, 1972, Ser. No. 235,234
Claims priority, application Sweden, May 17, 1971, 6406/71
Int. Cl. B66f 1/00, 3/00
U.S. Cl. 254—1 8 Claims



A tree felling guider in which a rod is adapted to be supported at one end on the ground in an inclined position with its other end provided with means to engage the tree trunk. The trunk engaging means comprises a stepping wheel provided with pointed teeth and means for rotating the wheel in one direction so that the rod end will move along the tree trunk toward its root. There is also provided a pawl for preventing rotation of the wheel in the opposite direction.

3,778,032
CANDY MIXER
Thomas E. Milling, Lake Zurich, Ill., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Mar. 1, 1972, Ser. No. 230,842
Int. Cl. B01f 7/04
U.S. Cl. 259—6 4 Claims

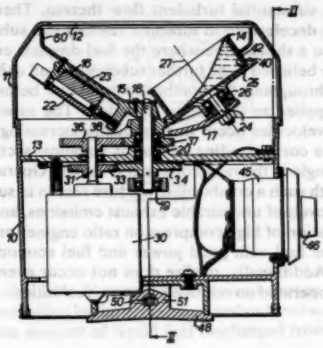


An apparatus is disclosed for mixing and conditioning aerated chocolate, aerated fat, and cereal particles in the manufacture of candy, the apparatus comprising an elongated trough open at the top and opened at one end of the bottom and having a plurality of rotatable intermeshing tines located within the trough, and wherein a material is placed at the top of one end of the elongated trough and then passes through the rotating tines and out the bottom of the other end onto the conveyor.

3,778,033
MIXING PROCESS AND APPARATUS
Burke Cole Pullman, London, England, assignor to Techno-Med Limited, London, England
Filed Feb. 29, 1972, Ser. No. 230,255
Claims priority, application Great Britain, Mar. 2, 1971, 5,746/71; June 14, 1971, 27,785/71
Int. Cl. B01f 9/00
U.S. Cl. 259—72 8 Claims

A mixing machine for rapid mixing of dental materials and other substances, having a high speed rotor head on a vertical

axis and an offset mixing vessel on an inclined axis with a common epicyclic drive from a single motor, such that the mixing vessel rotates at a controlled speed while the main rotor



rotates at high speed. This produces an enhanced centrifugal force and internal shearing, resulting in rapid mixing without air being entrained.

3,778,034

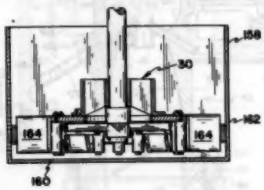
AGITATOR ASSEMBLY FOR RECOVERY OF MINERALS

Walter C. Giebel, Sheridan, Mont.

Division of Ser. No. 842,528, July 17, 1969, Pat. No. 3,700,103. This application Aug. 10, 1972, Ser. No. 279,569

Int. Cl. B01f 7/20

U.S. Cl. 259—107 **3 Claims**



Apparatus for treating ore pulp in a treatment cell attendant to recovery of minerals therefrom, the apparatus having a rotatable shaft with an attached impeller. A stabilizer device is joined to the cell adjacent the impeller so that a shear zone is developed in the ore pulp, the stabilizer device being configurated to maximize turbulence in the shear zone and minimize surging and boiling of the ore pulp at the surface thereof.

3,778,035

MOISTURE COMPENSATING SYSTEM

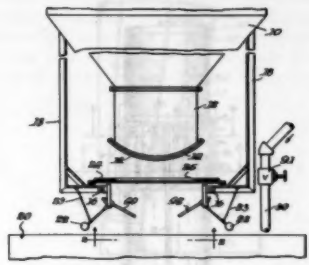
Paul W. MacKinney, 1012 E. Geneva Rd., Wheaton, Ill.

Division of Ser. No. 834,036, June 17, 1969, Pat. No. 3,631,337. This application Oct. 18, 1971, Ser. No. 190,363

Int. Cl. B28c 7/04

U.S. Cl. 259—154 **3 Claims**

A system for measuring the moisture entrained in a batch of aggregate material discharged from a storage hopper and for compensating for said moisutre in a batch mixing apparatus. The system includes a plurality of electrical probes arranged to project into a free-falling stream of aggregate material in a plurality of vertical portions of said stream, as said stream is discharged from the storage hopper. Electrical circuit means connected to said probes create an electrical signal proportional to the conductivity and hence the moisture content of each vertical portion of the aggregate stream. Signal accumulating means is also provided to accumulate and integrate said electrical signals during the time interval of aggregate material flow past said probes to provide a resultant electrical signal



which is proportional to the total entrained moisture in the aggregate batch. Data recording means is also provided to provide indicia of said moisture content of said aggregate in response to said resultant signal.

3,778,036

DEVICE FOR PLASTICIZING AND HOMOGENIZING VISCOUS MASSES

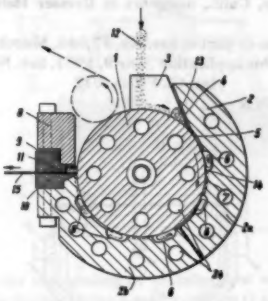
Heinrich Collin, Wilhelm-Meister-Str. 2, Munich, Germany

Filed Mar. 1, 1972, Ser. No. 230,796

Claims priority, application Germany, Mar. 3, 1971, P 21 10 179.1

Int. Cl. B29b 1/06

U.S. Cl. 259—185 **11 Claims**



A device for plasticizing and homogenizing viscous masses, especially plastics and rubber, in which processing of the material takes place between a rotating drum and a stationary semicylindrical trough partially surrounding the drum which, on the inner surface facing the drum, contains several mixing grooves each extending in a generally longitudinal direction along the inner surface of the trough structure and spaced circumferentially from each other. The grooves are interconnected by channels or slots so that they operate in a sequential manner cooperatively with the drum to properly mix the material introduced at the drum surface.

3,778,037

AERATOR WITH IMPROVED IMPELLER ACTION

Robert F. Dierbeck, Rt. 1, Adell, Wis.

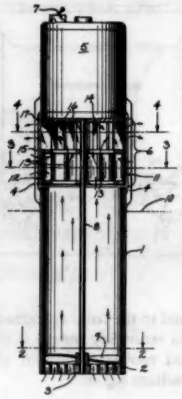
Filed May 4, 1971, Ser. No. 140,028

Int. Cl. B01f 7/32

U.S. Cl. 261—28 **6 Claims**

An aerator for bodies of water or other liquid which includes a submerged impeller which directs water or other

liquid upwardly to an aerating means disposed above the water level. The aerating means includes a two-part rotary member. The lower portion draws air in and mixes it with the



upwardly moving water. The upper portion forces the mixed air and water outwardly, where the water falls back into the body of water.

3,778,038

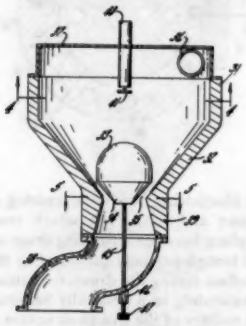
METHOD AND APPARATUS FOR MIXING AND MODULATING LIQUID FUEL AND INTAKE AIR FOR AN INTERNAL COMBUSTION ENGINE

James F. Eversole, Mamaroneck, N.Y., and Lester P. Berriman, Irvine, Calif., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 17,086, March 6, 1970, abandoned. This application June 9, 1971, Ser. No. 151,373

Int. Cl. F02m *9/12*

U.S. Cl. 261—50 R **17 Claims**



A combustible mixture of air and minute fuel droplets is produced for supply to the cylinders of an internal combustion engine. This mixture is formed by accurately controlling both the atomization of fuel and the mass flow rate of air over substantially the entire operating range of the engine. These controls are accomplished by introducing liquid fuel into a stream of intake air and uniformly distributing the fuel in the air followed by passing the air and fuel mixture through a constricted zone to increase the velocity of the mixture to sonic. The sonic velocity air at the constricted zone divides the fuel into minute droplets that are uniformly entrained throughout the air stream. The area of the constricted zone and the quantity of fuel introduced are adjustably varied in correlation with operating demands imposed upon the engine. Downstream from the constricted sonic zone, the air and fuel mixture is accelerated to supersonic velocity in a supersonic zone without imparting substantial turbulent flow thereto. Thereafter the mixture is decelerated to subsonic velocity in a subsonic zone to produce a shock zone where the fuel droplets entrained in the air are believed to be further subdivided and uniformly distributed throughout the combustible mixture before the mixture is supplied to the engine cylinders. The supersonic and subsonic velocities occur in a gradually increasing cross-sectional area corresponding to that of a conical section having an apex angle in the range of about 6° to 18°. Operation of the engine with such a combustible mixture results in substantially reduced levels of undesirable exhaust emissions, and also permits operation of high compression ratio engines on relatively low octane fuel with good power and fuel economy characteristics. Additionally, misfire does not occur even when the engine is operated on relatively lean air-fuel ratios.

3,778,039

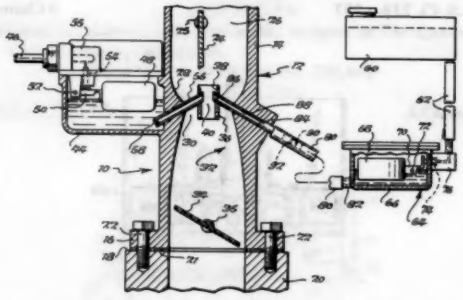
WATER INJECTION SYSTEM

Allen J. Dore, 7535 Transit Rd., East Amherst, N.Y.

Filed Dec. 5, 1972, Ser. No. 312,285

Int. Cl. F02m *25/02*

U.S. Cl. 261—18 A **4 Claims**



A system for injecting water into the boost venturi of a carburetor for ultimate introduction into the combustion chambers of a gasoline type combustion engine. The water flow is metered through an orifice in the water supply conduit at a predetermined ratio to the fuel and is injected into the constricted passage of the boost venturi at a level corresponding to the level of fuel injection.

3,778,040

FUEL SUPPLY CONTROL DEVICE

Hiroyuki Maruoka, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Sept. 23, 1971, Ser. No. 183,111

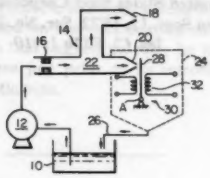
Claims priority, application Japan, Nov. 17, 1970, 45/101218

Int. Cl. G05b *1/01*

U.S. Cl. 261—36 A **5 Claims**

A device for controlling the amount of liquid fuel to be supplied to a desired device and having a source of liquid fuel,

comprising a fuel supply control unit including first and second nozzles and a pressure chamber, the degree of throttling of the second nozzle being varied by a valve member the



movement of which is controlled by a torque motor, whereby a pressure prevailing in the pressure chamber is varied thereby to control the amount of liquid fuel discharged from the first nozzle.

3,778,041

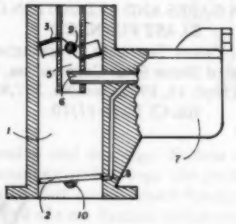
VARIABLE VENTURI CARBURETORS

Claude Robert Kincade, 804 Montgomery St., West Monroe, La.

Filed Mar. 8, 1971, Ser. No. 121,638

Int. Cl. F02m *23/02*

U.S. Cl. 261—50 A **1 Claim**



A variable venturi carburetor comprises respective vacuum sustaining and throttle plates, swingably disposed in respective input and output ends of said carburetor, said ends being connected by a through passageway mixture conduit. A nozzle tube conduit extends from said inlet end to discharge into said through passageway mixture conduit intermediate said vacuum sustaining and throttle plates. Fuel orifices are defined respectively in said nozzle tube conduit between a vacuum sustaining plate and said nozzle tube conduit discharge, and in said through passageway mixture conduit adjacent said throttle plate.

3,778,042

HUMIDIFIER FOR ENVIRONMENTAL CONTROL SYSTEM

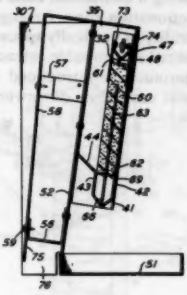
John Alan Schade, and Hans Levy, both of Cherry Hill, N.J., assignors to A.C. Manufacturing Company, Cherry Hill, N.J.

Continuation-in-part of Ser. No. 69,790, Aug. 4, 1970. This application May 18, 1972, Ser. No. 254,449

Int. Cl. B01f *3/04*

U.S. Cl. 261—105 **9 Claims**

An upstanding open support in an airway, an upper liquid feeder and a lower liquid collector, a pervious sheet extending across the support between the feeder and the collector for transmitting liquid therebetween while presenting the liquid to



passing air, and means to insure free liquid flow to and through the pervious sheet.

3,778,043

APPARATUS FOR THE COOLING OF BODIES UNDER PROTECTIVE GAS

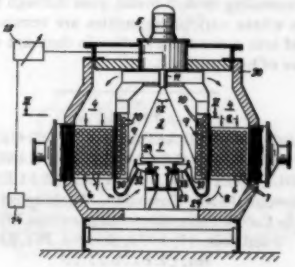
Theo Busch, Essen, and Rudolf Dienst, Baden-Baden, both of Germany, assignors to Ludwig-Ofag-Indugas Industrienlagen GmbH, Essen, Germany

Filed July 28, 1972, Ser. No. 276,152

Claims priority, application Germany, July 31, 1971, P 21 38 363.1

Int. Cl. C21d *9/00*

U.S. Cl. 266—2 R **7 Claims**



A system for the cooling of metallurgical workpieces and other singular bodies under a protective gas (i.e., a non-oxidizing or reducing gas) has a pair of cooling registers forming the walls flanking the path of the workpiece and consisting of ducts through which a cooling fluid passes transverse to the direction of flow of the protective gas. The latter passes into the cooling chamber from below after traversing a pair of heat exchangers of the tube-bank type while a control arrangement responsive to the mean value of the radiant energy omitted from the body serves to advance the workpiece from the chamber when a predetermined threshold value is attained.

3,778,044

METHOD AND APPARATUS FOR RECOVERY AND REFINING OF ZINC

Clayton R. Brown, 233 S. Hacienda Dr., Arcadia, and Milton Templer, 8013 San Lucas Dr., Whittier, both of Calif.

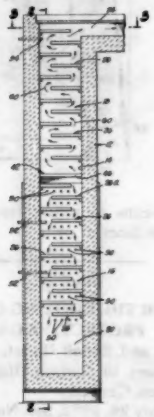
Filed July 13, 1971, Ser. No. 162,130

Int. Cl. C22b *19/14*

U.S. Cl. 266—19 **1 Claim**

A method and apparatus for recovering and refining zinc from scrap metals having a high zinc content. The scrap

metals are melted in a conventional furnace and introduced in a molten state into the distillation zone of the apparatus of the invention. The apparatus comprises an atmospherically sealed vertical column having a distillation zone and a communicating superposed fractionation zone. Arranged within the vertical column is a plurality of vertically spaced horizontally staggered trays constructed of a suitable refractory material. Molten material is continuously introduced into the apparatus through a metal seal and flows downwardly in a circuitous



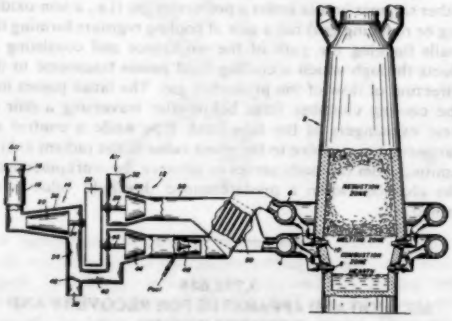
path over the trays disposed in the distillation zone. The metal in each tray is heated to temperatures sufficient to vaporize zinc by means of precisely controllable radiant heating elements located immediately above and below each tray. The zinc vapors rise through the distilling zone in countercurrent with the descending molten metal, pass through the factionating column where various impurities are removed, and then are directed into a condenser wherein they are condensed to metallic zinc of high purity.

3,778,045

GAS TURBO-BLOWER APPARATUS FOR GENERATING AND DELIVERING COMBUSTION GASES AND REDUCTION GASES TO A BLAST FURNACE

John H. Stevens, Peters Township, Washington County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Sept. 11, 1972, Ser. No. 287,934
Int. Cl. F27b *11/10*
U.S. Cl. 266—29 **1 Claim**



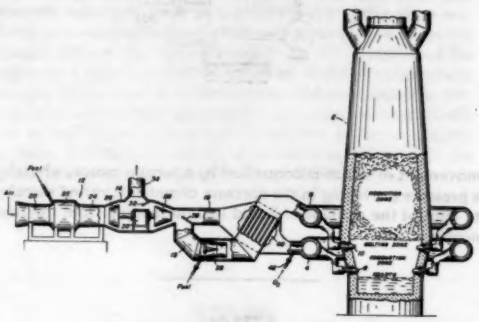
A gas turbine is utilized as the prime mover to drive a compressor in a device for supplying air at the proper temperature and pressure for combustion of carbon within a blast furnace and for supplying reducing gases at the proper temperature and pressure to assist in the reduction of iron oxides within a blast furnace.

3,778,046

JET ENGINE POWERED BLOWER FOR SUPPLYING COMBUSTION BLAST GAS AND REDUCING GAS TO A BLAST FURNACE

John H. Stevens, Peters Township, Washington County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Sept. 11, 1972, Ser. No. 287,937
Int. Cl. F27b *11/10*
U.S. Cl. 266—29 **3 Claims**



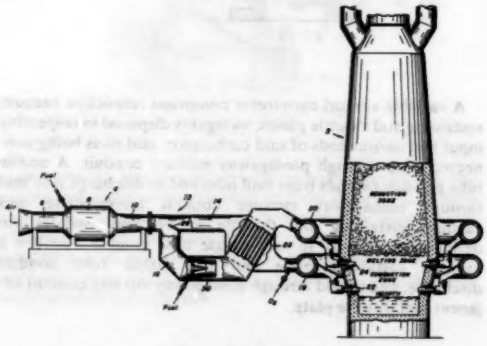
An aircraft-type jet engine is utilized as the source of gases for driving a free turbine which in turn drives a compressor to raise combustion blast gas pressure and reducing gas pressure to that required for blast furnace operation.

3,778,047

APPARATUS FOR GENERATING AND DELIVERING COMBUSTION GASES AND REDUCTION GASES TO A BLAST FURNACE

John H. Stevens, Peters Township, Washington County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Sept. 11, 1972, Ser. No. 287,938
Int. Cl. F27b *11/10*
U.S. Cl. 266—29 **2 Claims**



Described are two bustle pipes encircling blast furnace, one for receiving combustion blast gas under pressure and one for receiving reducing gas. Tuyeres lead from the combustion gas bustle pipe to the interior of the combustion zone of the furnace while other tuyeres lead from the reducing gas bustle pipe to the interior of the furnace immediately below its reduction zone. A gas turbine engine generates and supplies combustion blast gas made up of O_2, CO_2, H_2O and N_2 to the combustion gas bustle pipe through a duct for delivery to the combustion zone of the furnace. Part of the gas generated by the turbine engine is passed through an afterburner in the duct to raise the temperature of the gas and use up all of the excess

O_2 in the gas and form CO_2 and H_2O in the process thus transforming the gas into a superheated reducing gas made up of CO_2, H_2O and N_2. Both gases pass through a heat exchanger prior to being delivered to the respective bustle pipes whereby the temperature of the combustion blast gas is raised and the reducing gas temperature is lowered. If desired, an oxygen gas inlet may be provided on the duct portion carrying the combustion blast gas so that oxgyen gas may be injected into the combustion blast gas just prior to its introduction into the combustion gas bustle pipe.

3,778,048

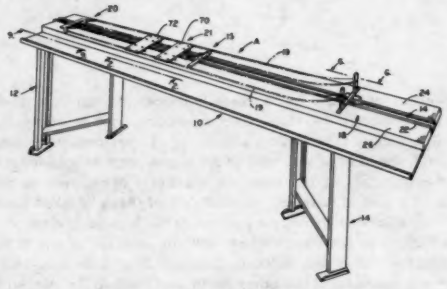
SKI BINDING MOUNTING APPARATUS

Zoltan L. Szohatsky, 5428 Wilson Dr., Mentor, Ohio

Continuation of Ser. No. 104,967, Jan. 8, 1971. This application Dec. 20, 1972, Ser. No. 316,960

Int. Cl. B25b *1/20*; **B23q** *3/18*; **B25h** *1/10*

U.S. Cl. 269—43 **7 Claims**



The specification and drawings disclose an apparatus for locating and mounting ski bindings. The preferred form of the invention includes first means which function to engage and locate the first end of a ski. Second means are spaced from the first and engage and locate the second end of the ski. Positioned intermediate the first and second means are third means for locating a ski binding positioning assembly relative to the ski positioned between the first and second means. At least two of the first, second and third means are mounted for movement in a direction generally along the longitudinal axis of the ski. Means interconnect the two movable means to maintain the relative spacing between the first, second and third means substantially constant during movement. Preferably, the ski binding positioning assembly comprises drilling jigs or templates having drill guide openings positioned to correspond to the screw locations on the bindings being attached. Also disclosed are special means for aligning skis having variations in toe and heel configurations.

3,778,049

ANGIOGRAPHIC CRADLE

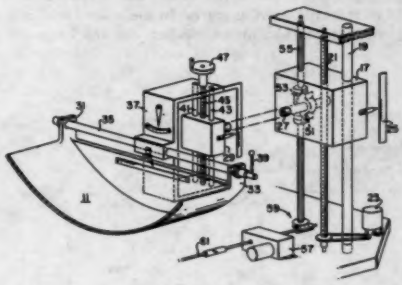
Manuel Viamonte, Jr., Coral Gables, Fla., assignor to Hyperion Incorporated, South Miami, Fla.

Filed Dec. 7, 1971, Ser. No. 205,693

Int. Cl. A61g *13/00*; **G01n** *23/00*

U.S. Cl. 269—323 **9 Claims**

The angiographic cradle disclosed herein permits a patient's body to be supported and rotated around a predetermined axis to facilitate radiological studies. The cradle itself is movable on two transverse axes with respect to the axis of rotation so that the axis of rotation can be caused to pass through a



selected portion of the patient's body. In this way, changes in X-ray source and film plane spacings are avoided.

3,778,050

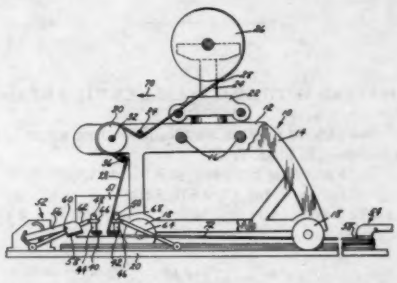
AUXILIARY FABRIC FEED MEANS FOR FABRIC SPREADING MACHINE

Harold Grimm, Bronx, and Ira Zuckerman, Far Rockaway, both of N.Y., assignors to Panther Machine Corp., New York, N.Y.

Filed Oct. 19, 1971, Ser. No. 190,564

Int. Cl. B65h *29/46*

U.S. Cl. 270—31 **8 Claims**



In a fabric spreading machine in which fabric is fed from a supply roll over a positive feed roller and then to fold-forming bars upon which a catcher bar falls to form a fold about the fold-forming bar and carry the fold to the table surface, means are provided for providing additional slack in the fabric as the catcher bar engages and presses down the fold on the fold-forming bar. The slack providing means includes a solenoid-operated linkage operative to move a tension-providing guide roller away from the positive feed roller to permit the fabric to hang loosely from the latter.

3,778,051

SUPERPOSED SHEET DETECTOR

James H. Allen, 17 Maryvale Dr., Webster, and Demetrios Polyzoes, 12 Buttermilk Hill, Pittsford, both of N.Y.

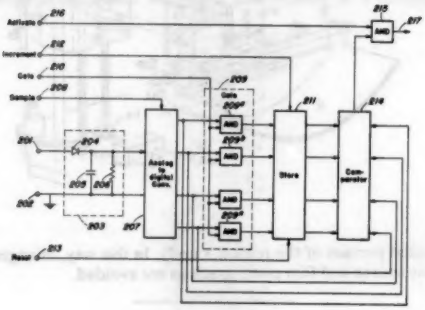
Filed Oct. 21, 1971, Ser. No. 191,459

Int. Cl. B65h *7/12*; **G06f** *7/38*

U.S. Cl. 271—57 **17 Claims**

Improved superposed sheet detecting apparatus is provided in accordance with the teachings of the present invention. Transducer means disposed in operable location to sheet feeding mechanism is adapted to produce signals proportional to the thickness of sheets of material fed past the operable loca-

tion. A multibit binary signal representative of the thickness of an initially fed sheet of material is gated into storage means whereat said multibit binary signal is stored. Multibit binary signals representative of the thickness of subsequently fed sheets of material are compared to the stored multibit binary signal by comparison means. When the thickness of a subsequently fed sheet of material exceeds the thickness of an initially fed sheet of material the comparison means produces an error signal, which error signal is detected by activatable detecting means. Detection of the error signal may result in the deflection of the subsequently fed sheet of material from the sheet feeding mechanism.



3,778,052

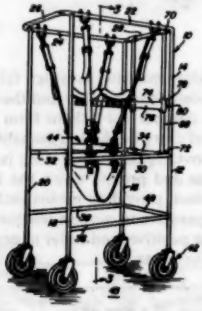
WALKER WITH ADJUSTABLE CRUTCH HEAD SUPPORTS

Paul Andow; David Guillen, and Raul G. Diaz, all of 215 Caples Building, El Paso, Tex.

Filed June 17, 1971, Ser. No. 153,949

Int. Cl. A61h *3/04*

U.S. Cl. 272—70.4 **4 Claims**



A wheeled support structure defining an open framework enclosure open on one side for egress thereinto and exit therefrom. The enclosure includes an adjustable height crotch sling and belt assembly for application to a handicapped person or a convalescent patient, opposite side rails defining handrails which may be gripped by the person using the walker and also vertically and transversely adjustable crutch heads for positioning beneath the base ends of the arms of a person using the walker.

3,778,053

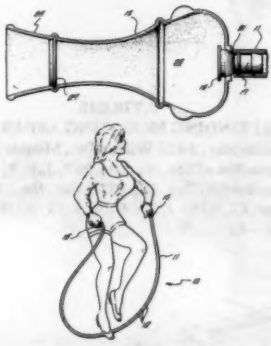
MUSICAL JUMP ROPE

Jay Smith, III, Pacific Palisades; Gerald W. Schmidt, Woodland Hills, and Lawrence T. Jones, Pacific Palisades, all of Calif., assignors to California R & D Center, Pacific Palisades, Calif.

Filed Feb. 10, 1972, Ser. No. 225,113

Int. Cl. A63b *5/20*

U.S. Cl. 272—75 **7 Claims**



A jump rope is disclosed which functions to produce a musical tone when in use. The jump rope comprises an elongated flexible hollow tube having a plurality of apertures extending through the skin of the tube at locations near its mid-length. The extremities of the tube are rotatively connected to the ends of a pair of handles. At least one of these handles has a bulbous chamber forming a portion of the handle, the interior of which is in communication with the interior of the tube. The outer end of the bulbous chamber flairs into a bell-like horn section to form the other portion of the handle. A reed is positioned within the handle at a location approximately between the bulbous chamber and the horn section. In operation, the jump rope is utilized in the same manner as conventional jump ropes. As the tube is being swung around the user's body, the movement of the tube causes air to quickly pass over the tube's skin surface. The centrifugal forces generated within the tubes combined with the outside air passing over the apertured surfaces of the tube function to move air from the interior of the tube through the tube apertures. This evacuation of the interior of the tubing causes air to be drawn in, through the one handle, into the interior of the tube. As the air passes through the handle, it actuates the reed to set it in vibration. The bulbous chamber functions as a resonance cavity to cooperate with the reed to produce a musical tone which is amplified by the horn section of the handle.

3,778,054

POOLSIDE SWING HAVING A SEAT WITH AN EJECTION SLIDE MECHANISM

Vincent J. Esposito, Jr., 31 Jackson Ave., Wayne, N.J., assignor to Erwin M. Barnett, Miami Beach, Fla., a part interest

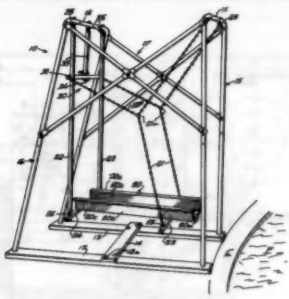
Continuation-in-part of Ser. No. 52,176, July 6, 1970, abandoned. This application Aug. 31, 1972, Ser. No. 285,516

Int. Cl. A63g *9/00*

U.S. Cl. 272—85 **11 Claims**

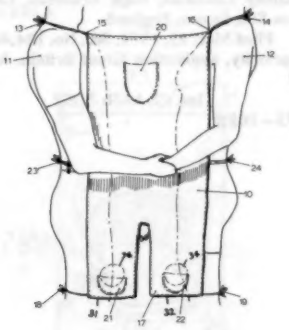
A swing-slide has an elongated seat sized and shaped to hold a rider in a seated position with his legs extended. The seat is suspended from an overhead support by front and rear suspension members to normally freely swing back and forth in a substantially horizontal position when the front suspension

member is shortened. Lengthening means for the front suspension member is automatically actuated by the height of



swing or manually by the rider whereby the front end of the seat is lowered converting the latter to an inclined slide for ejection of the rider into an adjacent body of water.

3,778,055
BALL GAME
Henry J. Witkowski, 5625 E. Lake Rd., Erie, Pa.
Filed Jan. 17, 1972, Ser. No. 218,077
Int. Cl. A63f *9/00*
U.S. Cl. 273—1 R **3 Claims**



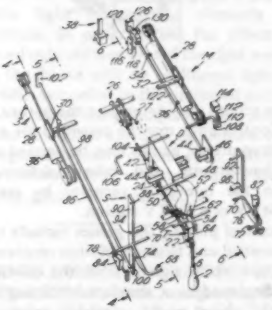
A rectangular garment with two of its sides extending vertically has two ties at each of its upper and lower corners and two ties midway along each vertical side. There is a pocket near the upper edge of the garment and two near the lower edge. The garment is attached by the ties to the necks, waists and legs of two players who are facing each other. A ball is placed in each of the lower pockets, adjacent the players' knees, and the players attempt to work the balls up between their bodies to the upper pockets adjacent their shoulders.

3,778,056
HAT GAME
Henry J. Witkowski, 5626 E. Lake Rd., Erie, Pa.
Filed Jan. 28, 1972, Ser. No. 221,505
Int. Cl. A63f *9/00*; **A63b** *71/04*
U.S. Cl. 273—1 R **8 Claims**

A game made up of an apron and a hat. The hat has a brim turned up to receive water and has a pin attached to the top. The apron has a trough about waist high extending around it. The hat is adapted to receive water in its trough around it. The object of the game is to fill the hat crown with water, walk over an obstacle course, and pierce a balloon which is filled with water or air and supported on a wall or the like without spilling any water from the hat crown into the hat brim. If water is spilled into the brim, it can leak out through holes in

the brim into the trough. The skirt alone may be used to play a game with a ball rolling around the trough of the skirt.

3,778,057
TETHERED BOWLING PIN APPARATUS WITH FELLED PIN SENSORS CONTROLLING OPERATION THEREOF
Jacob John Leidl, 69 Cherrystone Dr., Willowdale, Ontario, Canada
Filed Oct. 20, 1972, Ser. No. 299,262
Int. Cl. A63d *5/08*
U.S. Cl. 273—44 **23 Claims**

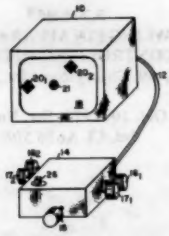


Apparatus for automatically resetting tethered bowling pins including a tether tension responsive device, a lift mechanism for raising and resetting the pins, a clutch assembly associated with each tether, and a device for controlling the clutch assemblies. The tension responsive device includes a pawl associated with each tether in such manner as to be disengaged therefrom in response to the tension in the tether which results from the felling of the associated pin. Upon the sensing of any felled pin, the lift mechanism is operated to raise all of the pins to a standby position. After the pins have been raised to their standby position, those tethers associated with felled pins are braked by their respective clutch assemblies, and the remaining pins are reset by the lift mechanism. In the event that all the pins are felled by a ball, the operation as described above is repeated with the exception that after all of the tethers have been braked by the clutch assemblies, the latter are restored to neutral positions by the clutch assembly control device to thereby allow all the pins to be reset.

3,778,058
METHOD OF EMPLOYING A TELEVISION RECEIVER FOR ACTIVE PARTICIPATION
William T. Rausch, P.O. Box 262, off Main St., Hollis, N.H.
Division of Ser. No. 828,154, May 27, 1969, Pat. No. 3,659,284. This application June 17, 1971, Ser. No. 154,162
Int. Cl. A63f *7/06*; **G08b** *5/22*; **H04n** *7/18*
U.S. Cl. 273—85 R **10 Claims**

Methods and the additional apparatus used to carry out these methods are herein disclosed for use in conjunction with

standard monochrome and color television receivers, for the generation, display and manipulation of symbols or geometric figures upon the screen of the television receivers for the purpose of playing games. The invention comprises in one embodiment a control unit, connecting cables and in some applications a television screen overlay mask utilized in conjunction with a standard television receiver. The control unit includes the control knobs switches and electronic circuitry for the generation, manipulation and control of video signals which are to be displayed on the television screen. The symbols are generated by developing current pulses proportional to predetermined portions (slices) of horizontal and vertical sawtooth waves. The connecting cables couples couple signals to the receiver antenna terminals thereby using existing electronic circuits within the receiver to process and display the signals. An overlay mask which may be removably attached to



the television screen may determine the nature of the game to be played. Control units may be provided for each of the participants. Alternatively, games may be carried out in conjunction with background and other pictorial information originated in the television receiver by commercial TV, closed-circuit TV or a CATV station.

The methods of playing the games include the steps of attaching the control unit to the television receiver, and generating at least two video signals from the control unit, which signals are displayed as a simulated "hitting" object and a simulated "hit" object on the television screen. A participant using the control unit then manipulates one of the control knobs to cause movement, independent of the hit object, of the hitting object over the television screen in a desired direction selected by the participant in an effort to make the two objects "collide" on the screen.

3,778,059

AUTOMATIC GUNNERY SHOCK WAVE SCORING APPARATUS USING METALLIC CONDUCTORS AS SHOCK WAVE SENSORS

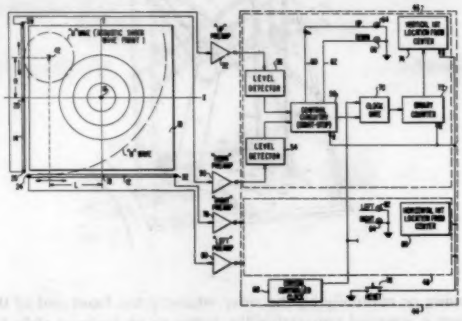
George W. Rohrbaugh, and Frank G. Bamser, Jr., both of State College, Pa., assignors to The Singer Company, New York, N.Y.

Continuation of Ser. No. 19,324, March 13, 1970, abandoned. This application Sept. 28, 1971, Ser. No. 184,605

Int. Cl. F41j 5/00

U.S. Cl. 273—102.2 S **15 Claims**

An automatic gunnery scoring system responsive to the airborne acoustic shock wave produced by a projectile such as a bullet or the like as it passes through a target area and comprising mutually perpendicular elongated acoustic energy conductors located adjacent the perimeter of the target with one or more acoustic transducers attached to an end or ends thereof, but no more than one on each end, for producing an electrical signal when the shock wave from the projectile is transmitted thereto through the respective conductor means. Four electrical signals are thus produced which are fed to



electronic circuitry to determine the location of each "hit" on the target in rectangular coordinates and providing a suitable indication thereof.

3,778,060

TARGET FOR USE ON WATER OR LAND

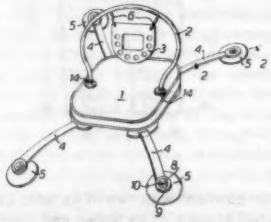
Thomas Ashley Lakeman, High Branches, Collington Rise, Bexhill-on-Sea, Sussex, England

Filed Mar. 15, 1971, Ser. No. 124,405

Claims priority, application Great Britain, Mar. 17, 1970, 12,696/70

Int. Cl. A63b 71/02

U.S. Cl. 273—102 S **2 Claims**



A ball game apparatus having a rigid buoyant base member, an arch formed over the base member and legs projecting from the base member to minimize rotation of the apparatus in water and to render it more stable on land. A ball is tossed at the target formed by the arch over the base in an attempt to have the ball pass therethrough. The ball can also be bounced off the base member to pass through the arch.

3,778,061

CONVERTIBLE HORSESHOE PIT

Walter W. Sargent, 125 North St., Chardon, Ohio

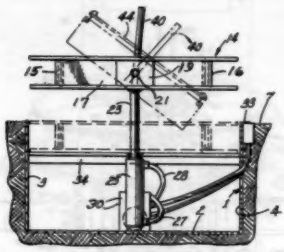
Filed Nov. 13, 1972, Ser. No. 306,354

Int. Cl. A63b 71/02

U.S. Cl. 273—104 **6 Claims**

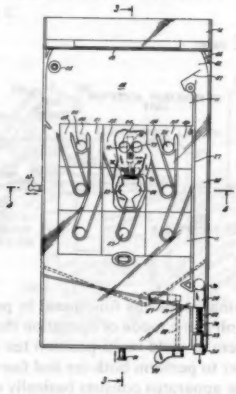
There is disclosed a horseshoe pit construction which is provided in a package for installation in the ground and having a pit member that is supported by a frame for raising out of a

chamber or housing and which will enable the pit member to be rotated so as to present a surface flush with the ground when lowered into position, a removable cover means being



furnished to close the member and retain the usual clay availed of in such horseshoe game play therein, at the same time allowing the clay to assume a level condition for subsequent use.

3,778,062
GAME APPARATUS
Kenneth C. Sherwood, New York, N.Y., assignor to Kae-Tee Development Corp., New York, N.Y.
Filed Dec. 30, 1971, Ser. No. 213,884
Int. Cl. A63d 3/02
U.S. Cl. 273—121 A **10 Claims**

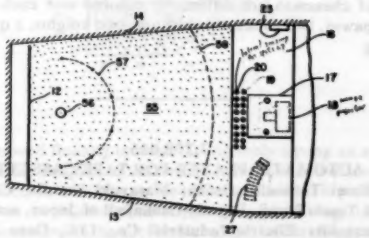


Structure by which two or more players alternately project an element, such as the ball, to cause it to fall into different openings on a display panel, thereby to initiate display effects on a viewing element coordinated therewith. The game is played so that the players strive to provide observable effects which align themselves according to a pre-established path. The first player to achieve the alignment is the winner. Other players by the success of their operations may be able to interrupt the sequence of display on the path achieved by the other player and thereby enter an effect on their own account of a display along a different path or to destroy the sequence already established by the first player. The operation is achieved normally by projecting a ball to follow through different openings of a main panel from each of which a display is initiated. Alternate balls projected by different players occur in such a way that different display effects necessarily are developed.

3,778,063
TICK-TACK-TOE-LIKE LIGHT GAME WITH COLOR CHANGEABLE SQUARES
Jack W. Strand, 1038 Park Ave., River Forest, Ill.
Filed Mar. 13, 1972, Ser. No. 234,284
Int. Cl. A63f 3/00
U.S. Cl. 273—130 AB **12 Claims**

There is disclosed an apparatus which may be used to demonstrate the effect of adding and subtracting colors and which may also be used as a tick-tack-toe-like game. The apparatus comprises a frame member having opaque sides, an open top portion and a light source located within the frame member. At least two identical layers are positioned in vertically spaced relation to each other within the frame and above the light source. The layers each comprise a plurality of relatively movable light transmitting elements which have preselected colors. In order to see the effect of changing colors, one need only replace one of the light transmitting elements within the frame with an additional light transmitting element of a different color. In the preferred embodiment, the apparatus makes use of the principle of subtractive color mixing. Each of the individual movable elements is colored in one of the three pigment primary colors; cyan, yellow and magenta. When two primary colors are combined, a secondary color appears; namely, green, blue and red.

3,778,064
SIMULATED GOLF GAME DEVICE
Gerald E. Nutter, Canton, Mass., assignor to Golf-In Equipment Corporation, Braintree, Mass.
Filed Apr. 10, 1972, Ser. No. 242,328
Int. Cl. A63b 67/02, 69/36
U.S. Cl. 273—176 FA **7 Claims**



A device for simulating the playing of a game of golf utilizes a screen toward which a player drives a golf ball. On the screen are projected images of a golf course recorded on a film strip showing in successive frames the distance to the green from successively closer lies of the ball. Two rows of photocells detect the passage of the golf ball and the club head. A player can thus practice swinging the golf club without setting off the device. Upon detection of the passage of the golf ball and the club head, an indication of the distance the ball would travel in an uninterrupted path is provided by the projection of an image showing the green as viewed from the approximate lie of the ball. The interval of time in which the ball passes over the two rows of photocells is converted

into distance of ball travel by the accumulation of a count in a counter. Upon the passage of the club head over the rows of photocells, a gate is opened to permit the count in the counter to be advanced to a preset total and on the attainment of that total, the gate is closed. During the time the gate is open, signals passing through the gate actuate a stepping motor which moves the film strip to the frame which shows a view of the green from the remaining distance. That frame is projected on the screen. Where the ball is driven beyond the cup, the stepping motor is conditioned to drive the film strip in the reverse direction on the next hit of the golf ball. Detection by the photocells of the passage of both the golf ball and the club head is necessary to enable the device to complete a full cycle of operation.

3,778,065

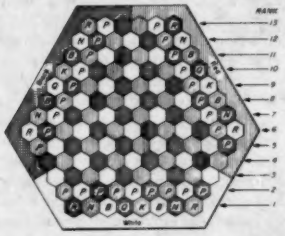
THREE-PLAYER CHESS GAME APPARATUS

Norman L. Hale, P.O. Box 246, Santa Cruz, N. Mex.

Filed Apr. 14, 1972, Ser. No. 244,040

Int. Cl. A63f *3/02*

U.S. Cl. 273—131 AB **4 Claims**



A game apparatus consisting of a hexagonal, planar board comprising a plurality of equi-dimensional, contiguous, uniformly distributed hexagonal playing spaces thereon and three sets of chessmen adapted to be disposed on the board and to be moved thereover in accordance with the rules of the game. The board has a hexagonal periphery including three sides made up of eight playing spaces each and three sides made up of six playing spaces each. One-third of the spaces are of a first color, one-third of a second color, and one-third of a third color, and the spaces are so arranged that each space is completely surrounded by spaces of a different color. The sets of chessmen are differently colored and each includes nine pawns, two rooks, two bishops, two knights, a queen and a king.

3,778,066

AUTOMATIC PLAYER FOR TAPE CASSETTES

Yoshifumi Teruuchi, Osaka; Masayuki Namiki, Chiba-ken, and Tomio Nishii, Higashi-Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Oaza Kadoma, Kadoma-shi, Osaka, Japan

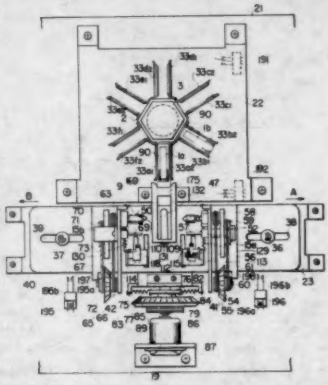
Filed July 27, 1970, Ser. No. 58,549

Claims priority, application Japan, July 28, 1969, 44/60690; July 28, 1969, 44/60691; July 28, 1969, 44/60692; July 28, 1969, 44/60693; July 28, 1969, 44/60694; July 28, 1969, 44/60695; July 28, 1969, 44/60696; July 28, 1969, 44/60697; July 28, 1969, 44/60698; July 28, 1969, 44/60699; July 28, 1969, 44/60700; July 28, 1969, 44/60701; July 28, 1969, 44/60702; July 28, 1969, 44/60703; July 28, 1969, 44/60704

Int. Cl. G11b *15/12*

U.S. Cl. 274—4 F **10 Claims**

In a magnetic tape recording and reproducing apparatus which is capable of playing a plurality of tape cassettes either selectively or continuously, an automatic payer for tape cassettes which is so designed that a plurality of tape cassettes mounted in a movable cassette mount are carried to a casette



playing section by a carrier, played at the cassette playing section and then returned to the cassette mount again by the carrier, one at a time.

3,778,067

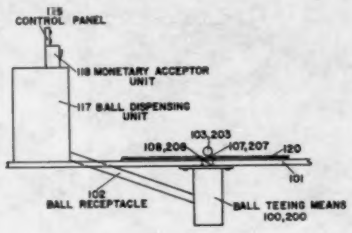
AUTOMATIC GOLF BALL TEEING APPARATUS

Joseph A. Gentiluomo, 1456 Belmont Ave., Schenectady, N.Y.

Filed Feb. 22, 1971, Ser. No. 117,452

Int. Cl. A63h *57/00*

U.S. Cl. 273—201 **22 Claims**



A golf ball teeing apparatus functional in providing either golf practice or golf game mode of operation through an open-loop control system to yield multi-position tee elevation, thus enabling the golfer to perform both tee and fairway shots from the same tee. The apparatus consists basically of a ball teeing means having a reciprocating tee to elevate the ball from a lowermost ball receiving position to either an intermediate ball hitting position or an uppermost ball hitting position, a ball dispensing means for storing a plurality of balls, a ball receptacle for receiving or storing balls for subsequent use by the ball teeing means, a vend initiating means for initiating apparatus operation, a counter to monitor the number of balls to be supplied to the ball teeing means per vend, and pushbutton and punched tape control means for inciting tee height positional commands to the teeing means.

3,778,068

PHONOGRAPH RECORD INTERLOCKING MEANS

Glen T. Moore, 405 W. 57th St., New York, N.Y.

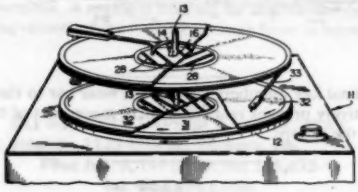
Filed Oct. 2, 1972, Ser. No. 294,256

Int. Cl. G11b *3/00*

U.S. Cl. 274—42 R **9 Claims**

Applied to or formed on the label portion of the phonograph disc is a plurality of spaced apart ridges in substantially

parallel array. When two phonograph records rest flat one upon the other on a phonograph turntable, rotating slippage of the upper record relative to the lower record is prevented by virtue of the ridges on adjacent records engaging each other angularly so that the rotation of the lower record causes the



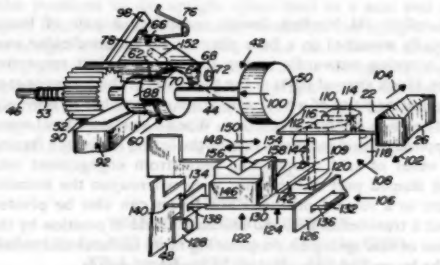
rotation of the upper record. The ridges may also be mounted on records by way of a thin, flexible plastic disc on the upper surface of which is applied or formed the array of spaced redges. The plastic disc is applied to the label area of the record by means of a pressure-sensitive adhesive or other suitable means.

3,778,069

MODE SELECTOR DISENGAGE MECHANISM

Alfred R. Harlan, Glendale Heights, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 6, 1971, Ser. No. 205,230
Int. Cl. G11b *15/10, 15/18*
U.S. Cl. 274—4 C **10 Claims**



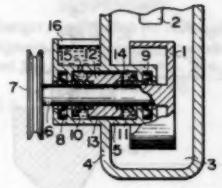
A mode selector disengage mechanism for a cassette tape player-recorder is operable to remove the player-recorder from a record mode and to actuate a cassette eject mechanism upon operation of a fast forward-reverse tape drive control. A pivotal interlock arm is engageable with a cam member on the mode selector control. Depression of the mode selector control against the force of a biasing spring causes the engagement of the interlock arm and cam member, the former thereby capturing the latter to hold the mode selector control in a record condition. The cam member likewise operates a snap-switch to complete a circuit to a holding coil for the cassette eject mechanism. A second cam member coupled to the interlock arm and the fast forward-reverse drive control pivots the interlock arm to release the first-mentioned cam member upon movement of the last-mentioned drive control to either of the fast forward or reverse positions. The biasing spring in response thereto, moves the mode selector control to a non-record condition, whereby the snap-switch is unoperated to release the holding coil, thereby permitting the eject mechanism to eject the cassette from the player-recorder.

3,778,070

ROTARY SHAFT AIR-TIGHTLY FITTING DEVICE

Yoshihiro Shimura, Nakano-ku, Tokyo, Japan, assignor to Rigaku Denki Company, Ltd., Tokyo, Japan

Filed Feb. 24, 1972, Ser. No. 228,923
Claims priority, application Japan, Aug. 31, 1971, 46/66344
Int. Cl. F16j *15/16*
U.S. Cl. 277—58 **1 Claim**



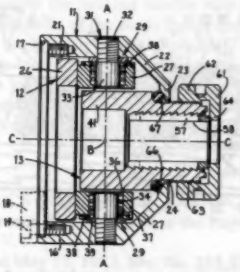
This invention relates to a device for air-tightly fitting a rotary shaft, for example, for an anode in a rotary opposite cathode X-ray tube whereby it is made possible to remarkably elongate the life of each packing by reducing the wear of the packing without causing a leakage by reducing the pressing contact force of the packing with a centrifugal force.

3,778,071

FLOATING TOOL HOLDER

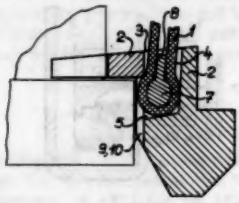
James R. Buck, Ross Township, Kalamazoo County, Mich., assignor to Buck Tool Company, Kalamazoo, Mich.

Filed Jan. 31, 1972, Ser. No. 222,359
Int. Cl. B23b *31/08*
U.S. Cl. 279—16 **9 Claims**



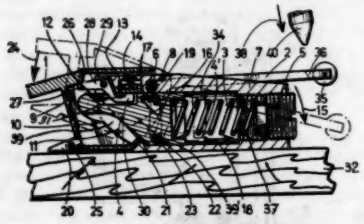
An improved floating tool holder assembly having an annular tool holder adapted to receive therein the shank of a suitable tool, such as a drill or reamer. The tool holder is pivotally mounted on an intermediate support for permitting limited pivotal movement of the tool holder about a first axis perpendicular to the longitudinal axis of the tool. The intermediate support is in turn pivotally mounted upon a surrounding housing for permitting the intermediate support to pivotally move about a second axis which is perpendicular to the longitudinal axis of the tool, the second axis also being substantially perpendicular to the first axis. Suitable resilient compression members are disposed between the housing and the intermediate support at the points of pivotal connection therebetween, and further resilient compression members are disposed between the intermediate support and the tool holder at the points of pivotal connection therebetween, whereby the tool holder can also float laterally a limited amount to compensate for irregularities or misalignment between the tool and the workpiece.

3,778,072
SECURITY BINDINGS FOR SKIS
Georges Pierre Joseph Salomon, Annecy, France, assignor to S.A. Francois Salomon & Fils, Annecy, France
Filed Dec. 4, 1970, Ser. No. 95,143
Claims priority, application France, Dec. 5, 1969, 6942070
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 N 5 Claims



A security device for maintaining a ski to the shoe of a skier after the main safety binding has opened, comprises a lash secured in a cavity of a block. The block is attached to the ski and the lash is attached to the shoe of the skier. At least a portion of the lash in the cavity is folded. At least a portion of a member enters between the fold to prevent the lash from leaving the cavity when a tensile stress is applied to the lash.

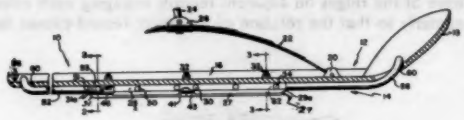
3,778,073
SKI BINDING
Georges Pierre Joseph Salomon, 34 ave de Loverchy, Haute-Savoie Annecy, France
Filed Dec. 28, 1970, Ser. No. 101,531
Claims priority, application France, June 1, 1970, 7019921
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T 5 Claims



The disclosure relates to a safety binding for ski boots consisting of a jaw pivotally mounted on the base and adapted to be alternately raised and lowered relatively to the base, a lever pivotally mounted on the base and adapted to be vertically set in two positions, a locking system disposed between two elements of a kinematic chain that includes the base, the lever and a movable member connected to the lever, and means operable for unlocking the locking system; a ski binding in accordance with the present invention has the advantage of doing away with the continuous pulling effort by the skier during clamping and unclamping of the ski.

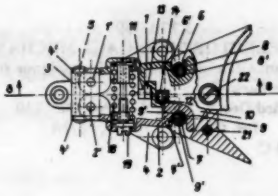
3,778,074
SNOWMOBILE SKI
Woodruff J. Kozlow, Box 728, Standish, Mich.
Filed May 16, 1972, Ser. No. 253,863
Int. Cl. B62b 17/02
U.S. Cl. 280—28 14 Claims

A snowmobile ski comprising a longitudinal runner and a keel, mounted on the underside of the runner, including a wear bar engageable with a surface to be traversed, a pair of clamps removably connected to the underside of the runner for releasably clamping opposite sides of the wear bar, and



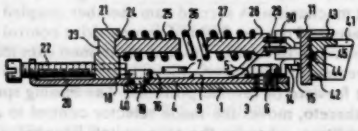
longitudinal key members locking the wear bar to the clamps to selectively prevent relative vertical movement of the wear bar and the clamps.

3,778,075
SKI BINDING
Francois Droz, La Chaux-De-Fonds; Jean-Paul Petitpierre, Les Rasses, and Joseph Tosalli, Sante-Croix, all of Switzerland, assignors to Reuge S.A., Sainte-Croix, Switzerland
Filed Nov. 29, 1971, Ser. No. 202,843
Claims priority, application Switzerland, Dec. 7, 1970, 18097/70; Dec. 23, 1970, 19123/70
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T 4 Claims



A safety ski binding device comprises a pair of levers pivotally mounted to a base plate about perpendicular axes and a spring outwardly urging the levers against respective stops. Hook shaped parts at the free ends of the levers engage cooperating parts of a boot sole gripping member to normally hold same in operative position. When a certain lateral stress is applied to said member, one of the levers is pivoted freeing the other of said cooperating parts from engagement with hook shaped part of the other lever whereupon the member pivots to a release position. The levers can also be pivoted about a transversal axis and releasably held in position by the action of said spring on cooperating ramp surfaces and rollers on the levers and base plate, or by magnetic means.

3,778,076
TOE IRON SAFETY SKI BINDINGS
Hans-Otto Frisch, Farchant, Germany, assignor to Hannes Marker, Garmisch-Partenkirchen, Germany
Division of Ser. No. 44,811, June 9, 1970. This application Feb. 4, 1972, Ser. No. 223,728
Claims priority, application Germany, June 19, 1969, P 19 30 997.8
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T 6 Claims



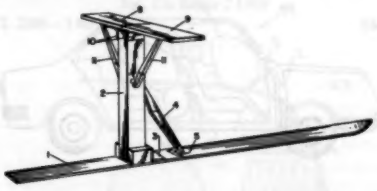
A soleholder member constitutes the coupling link of a four-bar linkage, which comprises levers layers that are con-

nected to a carrier, which is pivoted to a baseplate that is fixed to the ski. The distance between the fulcrums of the levers exceeds the distance between the pivotal axes of the soleholder member. That arm of each lever which does not carry the soleholder or member forms a locking member, which cooperates with a stop that is rigid with the baseplate. When the soleholder member is in its normal position, said locking members lock the carrier against a pivotal movement to respective sides. A spring is held on the carrier and opposes a pivotal movement of the four-bar linkage from its normal position.

3,778,077
SKI WITH COLLAPSIBLE RIDING SEAT

Mark M. Johnson, 1122 47th St., Sarasota, Fla.

Filed Jan. 5, 1972, Ser. No. 215,472
Int. Cl. B62b *13/00*
U.S. Cl. 280—12 K **1 Claim**

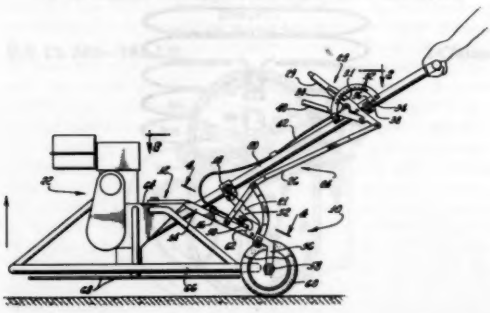


This invention relates to a ski adaptable for use both in snow skiing or water skiing and comprises a single ski having a rigid upright pivotally or hingeably connected to the upper surface of the ski between its ends, with suitable socket forming and upright supporting elements attached to the surface of the ski and engaging the upright near its end which rest upon the ski, together with seat forming members hingeably connected to the upper end of the upright which may be moved in right angular positions to the upright when used as a seat and collapsed into position substantially parallel to the upright when the upright is folded downwardly on the ski to form a compact easily portable unit. The invention further comprises hinged supporting braces connecting the upright to the ski and the seat forming members to the upright. The hinge brackets embody spring pressure means to securely hold the brackets in extended position and prevent their accidental collapse.

3,778,078
WHEEL ASSEMBLY DEVICE

Thomas Onder, 637 W. Hawthorne St., Ontario, Calif.

Filed June 5, 1972, Ser. No. 259,440
Int. Cl. B62d *21/18*
U.S. Cl. 280—43 **8 Claims**

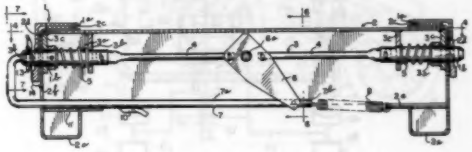


A wheel assembly device for use in conjunction with a conventional cement floor finishing machine, which permits movement of the cement floor finishing machine by a single person by means of the combination of wheels and assemblies of the wheel assembly device, which permits easy and rapid movement of the cement finishing machine without interference or damage to any part of the cement floor finishing machine.

3,778,079
APPARATUS FOR POSITIONING OF VEHICLE SUSPENSION

George F. Vornberger, and Arden A. Albaugh, both of Cincinnati, Ohio, assignors to Pullman Incorporated, Chicago, Ill.

Filed Jan. 7, 1972, Ser. No. 216,083
Int. Cl. B62d *53/06*
U.S. Cl. 280—80 B **10 Claims**

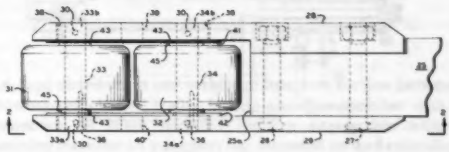


An apparatus for selectively positioning the sliding suspension frame or bogie relative to the trailer underframe including a bogie locking assembly having a handle and linkage operated spring-loaded locking pins for registering with holes in the fixed suspension rails attached to the trailer underframe wherein the handle and the locking pins are located centrally of the longitudinal extent of the bogie and wherein the locking pins and the locking pin links form a horizontal line in the locked position affording a positive lock and wherein the locking handle engages in an opening in one of the locking pins during the locked position of the bogie to the underframe and, further, wherein the locking handle may be moved to a position more outwardly of the bogie frame and held there for maintaining the bogie in an unlocked position with respect to the trailer undeframe and, further, wherein there is provided a safety pin which locks the handle to the locking pin and provides positive assurance that the locking pin will be retained in the hole of the fixed trailer underframe rail.

3,778,080
LIFT TRUCK LOAD WHEEL ARRANGEMENT

Arthur Bilco, Greene, N.Y., assignor to the Raymond Corporation, Greene, N.Y.

Filed May 15, 1972, Ser. No. 253,325
Int. Cl. B60g *1/00*
U.S. Cl. 280—104.5 R **11 Claims**



An arrangement for providing articulation of a lift truck load wheel pair without significantly increasing width or height of the truck leg supported by the pair, and without decreasing wheel size, comprises a pair of elongated rocker plates each carrying one end of a pair of wheel axles, with the rocker plates pivotally mounted in oversize openings in fixed side plates to rock against the faces of a pair of cams situated in the openings.

3,778,081

AUTOMATIC CONTROL SYSTEM TO PROVIDE STABILITY TO A VEHICLE

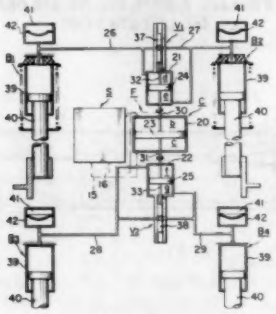
Noriyuki Takahashi, Tokyo; Hidehiko Inoue, Oimachi, and Yoshihiko Toshimitsu, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 1972, Ser. No. 252,029

Claims priority, application Japan, May 12, 1971, 46/31188

Int. Cl. B60g *11/28*

U.S. Cl. 280—112 A **1 Claim**



Automatic control system to provide stability to a vehicle, comprising a device which detects centrifugal force generated on the vehicle when it runs along a curved path, and cylinder means including valve and conduit means, the cylinder means being operated by the detecting device so that it adjusts the amount of fluid in one or more pairs of fluid dampers disposed respectively at right-side and left-side portions of the vehicle to incline the latter against rolling motion thereof occurring with the centrifugal force. The operation of the cylinder means is imparted to the detecting device in the form of a force counteracting the centrifugal force, to compensate the amount of fluid in the dampers, whereby the vehicle runs in a stable attitude.

3,778,082

SUSPENSIONS FOR VEHICLES

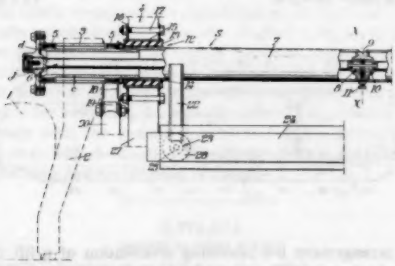
Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Sept. 13, 1972, Ser. No. 288,555

Claims priority, application France, Sept. 27, 1971, 7134709

Int. Cl. B60g *11/60*

U.S. Cl. 280—124 B **13 Claims**



The suspension comprises an arm fast to a hub mounted on the body of the vehicle by means of a transverse rotary bearing, the hub being anchored to the end of a transverse torsion bar arranged in a tubular transverse member. The suspension comprises elastic means with variable flexibility arranged between the body and at least one arm fast in rotation to the tubular transverse member, the elastic means exerting on the arm an effect tending to oppose oscillating movement of the wheel upwardly with respect to the body. The suspension is particularly useful as a rear suspension for a light vehicle with front wheel drive.

3,778,083

RIDER'S BODY PROTECTING DEVICE FOR A HIGH SPEED VEHICLE OPERABLE IN A COLLISION THEREOF

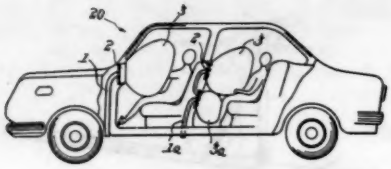
Masafumi Hamasaki, Nobeoki, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaki, Japan

Filed May 17, 1971, Ser. No. 143,921

Claims priority, application Japan, May 25, 1970, 45/44011; June 25, 1970, 45/62639

Int. Cl. B60r *21/08*

U.S. Cl. 280—150 AB **5 Claims**



In a rider's body protecting device for a high speed vehicle of the type including gas producing means and an inflatable bag adapted to be filled and inflated with gases from the gas producing means to support the rider's body, gas exhaust pipe means are provided which are so sized in pipe diameter as not to have any adverse effect on the inflation of the bag and allow a part of the gases fed in the bag to be released to the exterior of the vehicle. This advantageously serves to suppress any excessive rise of the gas pressure in the bag which may otherwise occur at the instant when the rider's body moving forward by inertia hits on the bag. Also, an auxiliary shock absorbing bag is employed in combination with the main bag in order to improve the stability of inflation of the bag means and the cushioning effect of the whole device.

3,778,084

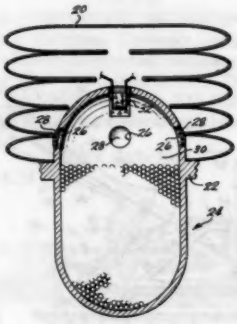
CRASH RESTRAINT MATRIX INFLATION SYSTEM

George S. Sutherland, Mercer Island, and Randel L. Hoskins, Woodinville, both of Wash., assignors to Rocket Research Corporation, Redmond, Wash.

Filed June 14, 1971, Ser. No. 152,627

Int. Cl. B60r *21/08*

U.S. Cl. 280—150 AB **4 Claims**

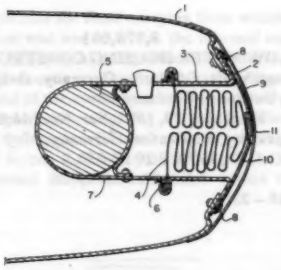


A crash restraint device for an automobile comprising an inflatable bag mounted forward of the automobile passenger

seat, which inflates upon crash impact. A bag inflating device comprising a matrix of a first composition which produces a higher temperature gas product, interspersed with increments of a second composition which endothermically produce a gas product of a lower temperature, with the resulting gas mixture being used to inflate the bag.

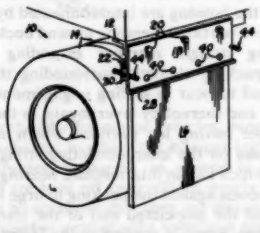
In one embodiment coolant gas producing particles are arranged in an interconnected matrix of an exothermically reacting gas producing composition. In a second embodiment there is a plurality of capsules, each having an interior of a vaporizing coolant material and a coating of an exothermically reacting composition. In a third embodiment there is a mixture of coolant particles and exothermically reacting gas producing particles.

3,778,085
CONCEALED PNEUMATIC SAFETY SYSTEM
Martin Lipkin, 445 E. 86 St., New York, N.Y.
Filed Oct. 6, 1971, Ser. No. 187,056
Int. Cl. B60r *21/08*
U.S. Cl. 280—150 AB **16 Claims**



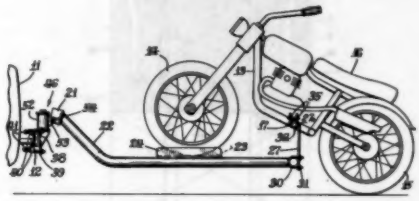
A concealed inertially operated pneumatic safety system including a box having an opening with diaphragm means therein, a collapsed balloon within said box fastened by gas-tight attachment, pressurized gas storage means and inertially powered gas release means, said gas release means being adapted to cause release of gas from said pressurized gas storage means in response to a predetermined deceleration or shock to said box, the released gas causing said balloon means to inflate sufficiently to force said diaphragm means aside and to fully inflate externally of said box means.

3,778,086
MUD FLAP MOUNTING MEANS
Peter N. Moore, and Leo F. Pierce, both of 117 S.W. 23, Oklahoma City, Okla.
Continuation-in-part of Ser. No. 116,775, Feb. 19, 1971, Pat. No. 3,700,260. This application Sept. 12, 1972, Ser. No. 288,477
Int. Cl. B62d *25/18*
U.S. Cl. 280—154.5 R **2 Claims**



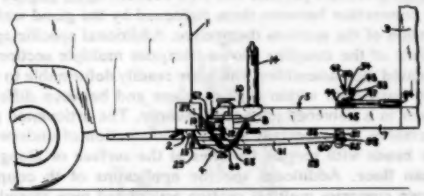
Spring urged clamp means, connected with a vehicle rearward support, grips the upper edge portion of a mud flap and supports it in combination with pins extending through the mud flap. Downwardly directed stress impressed on the depending portion of the mud flap opens the clamp means to release the mud flap.

3,778,087
MOTORCYCLE TOWING APPARATUS
Ralph M. Kallenbach, 915 Carol Ave., Elgin, Ill.
Filed Aug. 3, 1972, Ser. No. 277,666
Int. Cl. B62d *53/04*
U.S. Cl. 280—292 **4 Claims**



An elevated support extends under the front wheel of the motorcycle. The rear end of the support is rigidly attached to the foot pegs on the motorcycle. The front of the support is connected to the rear bumper of an automobile by a universal joint.

3,778,088
LOAD AND SWAY CONTROL FOR TRAILERS
Emmett L. Alexander, 802 S. Hayes, 12 Pembrook Square, Enid, Okla.
Filed July 26, 1971, Ser. No. 165,900
Int. Cl. B60d *1/06*
U.S. Cl. 280—406 A **8 Claims**



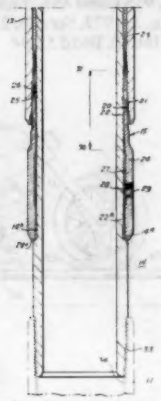
A load distribution and stabilizer structure for use between a towing vehicle and trailer having a tongue member with a connection or hitch member thereon engageable with a receiving member on a support bar mounted on and extending from the towing vehicle includes a truss member having arms carried below the trailer tongue and linkage members fulcrumed at the pivotal hitch. The truss member has a forward end with sliding braking engagement with a surface fixed relative the support bar and linkage adjustably connecting the rearward ends relative the tongue to apply force or leverage to the truss member to distribute the load on the trailer tongue member between the towing vehicle and the towed vehicle. The linkage and mounting holding the tongue and truss member against relative lateral movement for stabilization.

3,778,089

PIPE COUPLING

John V. Fredd. Dallas. Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Mar. 22, 1971, Ser. No. 126,539
Int. Cl. F16l 39/04, 39/04
U.S. Cl. 285—39 2 Claims



A pipe coupling for connection of a pair of longitudinally spaced pipe ends without rotation of either of the pipes connected by the well heads with service facilities at the surface or along the ocean floor. The coupling may also connect pipe members to provide a leakproof union allowing rotation of one pipe relative to the other. The coupling includes a first outer pipe section having inner threads and a second inner pipe section having external threads, at least one of such threads being tapered. The pipe sections are joined together by a threaded gland having inner threads mating with the threads on the inner pipe section and external threads mating with the inner threads on the outer pipe section. The gland has an extension projecting over the inner pipe section from the overlapping portions of the two pipe sections for engagement of a tool to turn the gland. One of the threaded connections with the gland stresses the gland sufficiently to tighten the other threaded connection with the gland. One form of coupling employing the invention comprises an extension joint for connecting spaced pipe ends. Another pipe joint embodying the invention permits two pipe sections to be aligned and the connection between them tightened by the gland without rotation of the sections themselves. Additional specific applications of the coupling shown comprise multiple section articulated pipe assemblies which are readily deformable to provide turns both within a given plane and between different planes in a universal joint type manner. The articulated pipe assemblies are especially suited to connection of underwater wee heads with service facilities at the surface or along the ocean floor. Additional specific applicatins of th coupling shwvn comprise multiple section articulated pipe assemblies which are readily deformable to provide turns both within a given plane and between different planes in a universal join type manner. The articulated pipe assemblies are especially suited to connection of underwater well heads with service facilities at the surface or along the ocean floor.

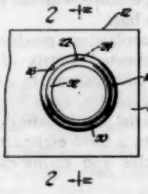
3,778,090

BEADED TUBE WITH O-RING SEAL CONNECTION

Michael F. Tobin, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 18, 1972, Ser. No. 254,561
Int. Cl. F16l 41/00
U.S. Cl. 285—222 5 Claims

A beaded tube with O-ring seal connection wherein a relative thin walled tube extending through a counterbored aperture in a tube block is upset to provide annular beads on opposite sides of the tube block to lock the tube to the tube block, an O-ring being positioned to encircle the tube in sealing engagement with a bead surface of the tube and with the walls of the counterbore in the tube block.

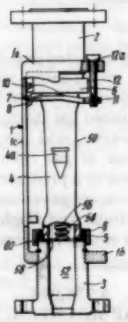


3,778,091

FLOW METER HOUSING CONSTRUCTION

Helmut Engelhardt, Duisburg, Germany, assignor to Ludwig Krohne, Duisburg, Germany

Filed May 19, 1971, Ser. No. 144,862
Claims priority, application Germany, May 19, 1970, P 20 24 238.0; Oct. 23, 1970, P 20 52 030.3
Int. Cl. F16l 49/00
U.S. Cl. 285—238 7 Claims



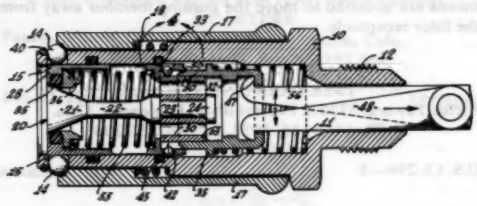
A fluid meter or gage which includes a central transparent portion through which the fluid is adapted to flow and which is usually made of a material such as glass so that a float indicator or similar phenomena therein is visible, also includes end fittings which are adapted to bear against respective ends of the central transparent member and be sealed therewith. The end fittings of the housing are interconnected by a yoke which includes a sleeve portion extending around each fitting and an interconnecting straight member extending between the sleeves. The packing elements surrounding the transparent portion is urged to bear in sealing engagement with the end fitting at each end thereof by lever means in the form of a U-shaped member having leg portions which are pivoted in selected recesses on the interconnecting straight member of the yoke and which has an intermediate bearing forming a fulcrum which presses against the packing to urge it into a sealing position around the associated end of the transparent intermediate member. Force is applied to the U-shaped lever by a threaded screw member which is engaged with the collar at each end.

3,778,092

FRONT END LOADING-SELF LOCKING FEMALE COUPLING

Vincent G. Magorien, Granada Hills, Calif., assignor to Seaton-Wilson Incorporated, Burbank, Calif.

Filed Sept. 20, 1971, Ser. No. 182,049
Int. Cl. F16l 37/18
U.S. Cl. 285—316 16 Claims



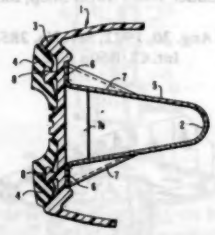
A female connector for fluid carrying lines which is assembled from its front end and in which the internal components are self-locking. All internal components are inserted from the front end of the female connector. A special tool inserted from the back end of the connector body then draws back one of the internal elements, allowing all of the internal components to be fully inserted. Release of the internal element by the special tool forces a plurality of locking balls outwardly, causing the internal components to lock within the female connector.

3,778,093

BUMPER FOR MOTOR VEHICLES

Hermann Renner, Boblingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkeim, Germany

Filed Sept. 17, 1971, Ser. No. 181,384
Claims priority, application Germany, Sept. 17, 1970, P 20 45 962.5
Int. Cl. B60r 19/08
U.S. Cl. 293—71 R 26 Claims



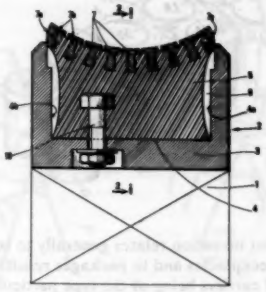
A bumper or the like for motor vehicles, especially for passenger motor vehicles, in which the bumper includes a bearer member constructed V-shaped, as viewed in cross section, whose leg ends are bent off vertically or nearly vertically into flanges and are so arranged that they are disposed on the side of the bearer member opposite the vehicle; a protective bar of rubber or similar material is mounted on the bumper, possibly by the interposition of a support member.

3,778,094

GRIPPING SHOE FOR A TRACTION DEVICE ADAPTED FOR PULLING AN ELONGATED MEMBER

Pierre Grolet, Orgerus, and Jean Thiery, Le Peco, both of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

Filed July 21, 1972, Ser. No. 273,709
Claims priority, application France, July 22, 1971, 7126959
Int. Cl. A47l 13/06
U.S. Cl. 294—1 6 Claims



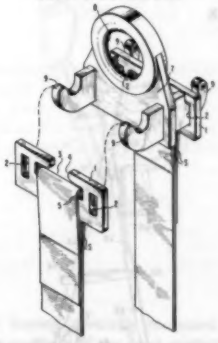
A gripping shoe for a traction device adapted for pulling an elongated member, including a rigid body provided with a recess, and forming part of the traction device, a deformable element housed in said recess and integral with said rigid body, said deformable element being provided with gripping means for contacting the elongated member and being constituted of a material resiliently deformable under the action of a compressional stress, substantially without any volume variation of said material, a free space being provided between said deformable element and the walls of said recess so as to accomodate the deformations of said deformable element.

3,778,095

SLINGS

David William Bentley Carr, Marthall, England, assignor to Spanset Inter AG, Basel, Switzerland

Filed Sept. 7, 1971, Ser. No. 177,935
Claims priority, application Great Britain, Sept. 5, 1970, 42,646/70
Int. Cl. B66c 1/18
U.S. Cl. 294—74 4 Claims



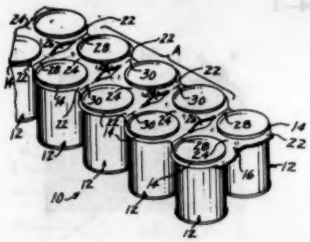
An end plate for a cargo sling having a pair of apertures for engagement by the terminal block of a crane, and a slot between the apertures, said slot being open on its top surface to enable a loop of webbing to be engaged in the slot, said opening having a width less than the length of the slot.

3,778,096

CONTAINER CARRIER AND PACKAGE

Stuart Allen Smith, Northbrook, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 6, 1972, Ser. No. 231,924
Int. Cl. B65d 71/00
U.S. Cl. 294—87.2 **1 Claim**



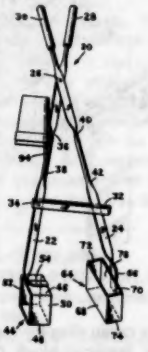
The present invention relates generally to improvements in carriers or receptacles and to packages resulting from the use thereof, said carriers being of the type particularly adapted to accommodate containers such as beverage cans and the like, wherein the extremity of the container is formed with an enlargement or bead. The embodiment of the container carrier or receptacle disclosed herein includes a strip of resilient, deformable, and elastic plastic material such as polyethylene, having a plurality of container-accommodating, longitudinally and transversely aligned apertures. These apertures are intended for telescopic association with the ends of the containers so that the margins of the strip aligning said apertures may be stretched and deformed to form circumferentially continuous lips embracing said containers beneath the peripheral enlargements thereof. Transversely aligned web sections connect said circumferentially continuous strip edges in longidudinal rows, and openings are provided for rendering said web sections frangible. Certain of said openings are of greater extent than others, whereby to facilitate the ease with which a portion of the strip supporting a plurality of containers may be detached as a unit from said strip.

3,778,097

METHOD AND DEVICE FOR RETRIEVING LITTER

Peter A. Dorzan, 1 Muir Pl., Vauxhall, N.J.

Filed Apr. 3, 1972, Ser. No. 240,461
Int. Cl. A47f 13/06
U.S. Cl. 294—118 **14 Claims**



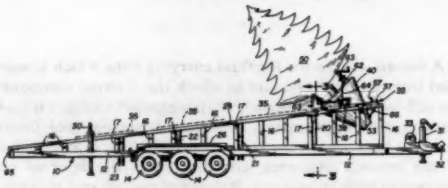
A device for retrieving litter has manually actuated positioning means connected to a litter receptacle holder and a pushing member adapted to be enclosed in an envelope releasably secured about the pushing member. Actuation of the positioning means causes coaction between a litter receptacle mounted in the litter receptacle holder and the enveloped pushing member, so that litter is forced into the litter receptacle and held in the litter receptacle by the pushing surface. While the litter is being held within the litter receptacle by the enveloped pushing member, the envelope is released from about the pushing member and reversed to envelop the opening of the litter receptacle. The litter receptacle can then be manually ejected into the envelope when the positioning means are actuated to move the pushing member away from the litter receptacle.

3,778,098

TREE CARRYING VEHICLE

Victor Tawara, 3750 S. Federal Blvd., Englewood, Colo.

Filed Mar. 16, 1972, Ser. No. 235,200
Int. Cl. B60p 3/00
U.S. Cl. 296—3 **2 Claims**



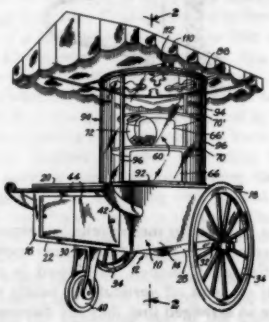
The tree carrying vehicle comprises a wheeled frame including a pair of spaced apart, longitudinally extending, parallel, inclined side rails which support a plurality of carriers movable thereon, a bucket for receiving the earth embedded root end of a tree for each carrier, cooperating means on each carrier and bucket pivotally detachably mounting a bucket on a carrier, and means retaining each carrier in a selected position on said side rails. Means for raising and lowering opposite ends of the frame to facilitate loading of carriers and buckets on the side rails, and means for retaining the buckets in selected tilted positions are also provided. The buckets have means therein for compressing the earth in which the tree roots are embedded.

3,778,099

CART

Harry Rogove, and Roslyn Rogove, both of Bayside, N.Y., assignors to Remember When Sweet Shop, Inc., Valley Stream, N.Y.

Filed Aug. 30, 1972, Ser. No. 285,089
Int. Cl. B60p 3/02
U.S. Cl. 296—21 **6 Claims**



A vending cart construction is described as including a base and a rotatable display member upstanding from and rotatably

attached to the base. Rotation of the display member is provided by a motor means. The base is mounted on a conventional carriage structure and includes outer and inner walls defining a forward storage space and a motor means storage space. A transparent display cover encircles the display member for the purpose of defining therewith an effectively air-tight display space. A door is included in the display cover to allow access to the display space.

3,778,100

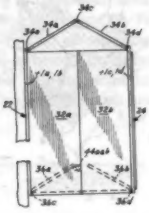
EXPANDABLE ROOM FOR PORTABLE LIVING QUARTERS

Paul A. Dillard, 5722 Chestnut Ave., Littleton, Colo.

Filed Oct. 22, 1971, Ser. No. 191,944

Int. Cl. B60p *3/34*

U.S. Cl. 296—23 G **15 Claims**



An expandable room, having folding floors, side walls and roof, folds to a very thin addition when not in use; for living units, attachments for trailers, campers and the like, and when expanded provides additional living space for such units.

3,778,101

SEALING ARRANGEMENT FOR VEHICLE BODY CONSTRUCTION

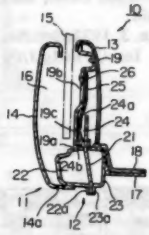
Yasuhisa Tsuda, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Kanagawa-ku, Yokohama, Japan

Filed July 10, 1972, Ser. No. 270,170

Claims priority, application Japan, July 10, 1971, 46/4650677

Int. Cl. B60j *5/04*

U.S. Cl. 296—154 **8 Claims**



A sealing arrangement used in a vehicle body construction for intercepting from the occupant compartment any water flowing into an enclosure accommodating therein a side window. The sealing arrangement is provided with upper and lower inner panels which are partially juxtaposed at a spacing from each other. The partially juxtaposed portions of the two panels define therebetween a water passage. The upper panel has at least one partially offset lowermost end adhered to the base enclosure member. A sealing partition is interposed between the two panels to extend midway of the water passage. Any water having stolen into the enclosure is blocked by the sealing partition and then is drained to the exterior of the vehicle body through a water vent formed in the base member.

3,778,102

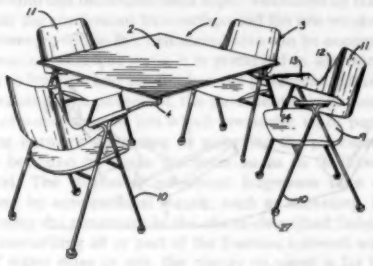
TABLE AND CHAIR STRUCTURE AND MEANS FOR PIVOTALLY MOUNTING CHAIRS

Bobbie L. Snyder, Lake Winnebago, Mo.; Ambrose Spencer, Merriam, Kans., and Harlan Butts, Lees Summit, Mo., assignors to Fixtures Mfg. Corp., Kansas City, Mo.

Filed May 19, 1972, Ser. No. 255,094

Int. Cl. A47c *3/00*

U.S. Cl. 297—170 **8 Claims**



A table and chair combination wherein a table top is supported on a plurality of spaced chairs with each having a separable connection providing a pivotal relation and a latch preventing separation in all positions except the separable position.

3,778,103

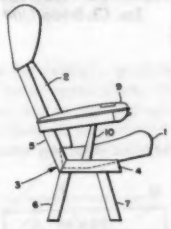
VEHICLE SEAT

Robert L. Edwards, Mansfield, Ohio, assignor to National Seating Company, Mansfield, Ohio

Filed June 30, 1971, Ser. No. 158,230

Int. Cl. B60n *1/06*; A47c *1/032*

U.S. Cl. 297—331 **10 Claims**



A vehicle seat having pivotally mounted seat and back cushions, with the position of the back cushion being adjustable by a recline actuator in the seat arm, such actuator having a cam operated trip release mechanism associated therewith which is operative both automatically to return the back cushion to an upright position by releasing the actuator when the seat cushion is pivoted upwardly and to hold the seat back in its upright position when the seat is subsequently pivoted downwardly.

3,778,104

SEAT CONSISTING OF SEAT PORTION AND BACKREST, ESPECIALLY DRIVER SEAT FOR MOTOR VEHICLES

Heinz Peter Kusters, Erdmannhausen, Germany, assignor to Firma DR. -Ing. h.c.F. Prosche K.G., Stuttgart-Zuffenhausen, Germany

Filed Apr. 21, 1971, Ser. No. 135,834

Claims priority, application Germany, Apr. 21, 1970, P 20 19 069.6

Int. Cl. A47c *7/00, 7/20, 3/00;* B60n *1/06*

U.S. Cl. 297—458 19 Claims

A seat with cushion supports for vehicles, especially motor veicles, which consists of a seat portion and a backrest, and in which a fatigue-free seating is achieved by the combination of the following features:

a. the seat portion and the backrest consist of molded shells that are covered with removable cushion supports;

b. the backrest of the seat is provided with support surfaces within the area of the shoulder blades and of the lumbar vertebrae; and

c. the cushion support of the seat portion is constructed more hard within the area of the ischium tuberosities of the pelvis.

3,778,105

DEVICE FOR STABILIZING REAR-TIPPING VEHICLES

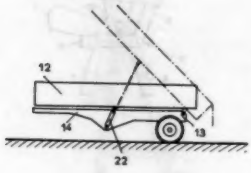
Andre Widhoff, Paris, France, assignor to Frangeco, a Societe Anonyme Francaise, Puteaux-Hauts de Seine, France

Filed Dec. 30, 1970, Ser. No. 102,679

Claims priority, application France, Jan. 6, 1970, 7000238

Int. Cl. B60p *1/04*

U.S. Cl. 298—17 S 1 Claim



Means are provided on either side of the rear axle of a dumping vehicle to limit the distance that the sides of dumping body can move away from the axle on being dumped, so as to avoid any lateral shifting of the center of gravity of the load due to relaxation of one of the side springs, especially when the vehicle is parked for dumping on a laterally inclined surface.

3,778,106

CONTROL MECHANISM FOR ROCK CUTTING EQUIPMENT

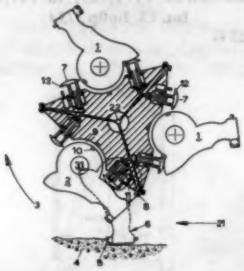
Richard F. Taylor, Honeydew, and Christos Dimitriou, Johannesburg, both of Republic of South Africa, assignors to Anglo-Transvaal Consolidated Investment Company Limited, Johannesburg, Transvaal, Republic of South Africa

Filed July 25, 1972, Ser. No. 275,051

Claims priority, application South Africa, July 29, 1971, 71/5063

Int. Cl. E21c *29/00*

U.S. Cl. 299—1 9 Claims



This invention relates to the control of the speed of traverse of a rock cutting machine utilizing an operating head in the form of a rotor carrying swinging hammers. The control is effected by comparing the position of the hammer relative to the rotor at a predetermined time after impact with the position at which the hammer would have been if it had struck at its optimum position relative to the rotor. Any difference in the positions compared is then used to control the speed of traverse of the machine to bring about an elimination of this difference and thus ensure that the hammers strike in their optimum positions.

3,778,107

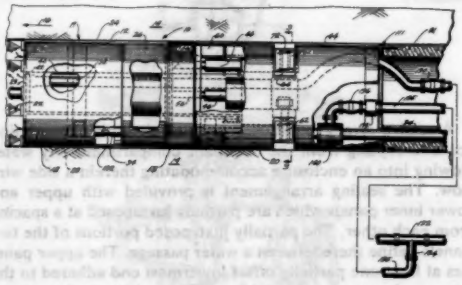
REMOTE-CONTROLLED BORING MACHINE FOR BORING HORIZONTAL TUNNELS AND METHOD

John C. Haspert, Arcadia, Calif., assignor to Ameron, Inc., Monterey Park, Calif.

Filed Jan. 3, 1972, Ser. No. 214,681

Int. Cl. E01g *3/04*

U.S. Cl. 299—11 41 Claims



A remote-controlled tunnel boring machine for drilling a substantially horizontal tunnel in a formation includes a rotary drilling head at the heading of the tunnel, and a rotary drill pipe coupled to the drilling head and extending back to the

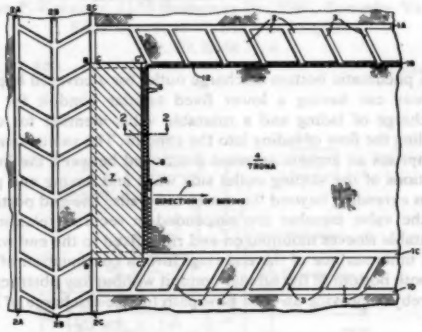
portal of the tunnel for connection to drive means for rotating the drill pipe. The drilling head has fore and aft sections which are movable longitudinally relative to each other, the aft section being coupled with a series of interconnected tunnel liner sections jacked into place behind it from the portal as the drilling head advances through the tunnel. Hydraulic rams between the fore and aft sections periodically advance the drilling head to excavate material at the heading of the tunnel, the weight of the aft section and the tunnel liners acting as a thrust base or back-up for the extension of the rams. A second set of hydraulic rams at the portal periodically force new tunnel liner sections into place behind the string of tunnel liners. Cuttings are continuously removed from the tunnel heading by drilling fluid circulated in a closed system which includes an elongated conduit extending from the portal to the drilling head to continuously supply drilling fluid to the tunnel heading. The cuttings and drilling fluid are continuously returned from the tunnel heading to the portal area through the interior of the constantly rotating drill pipe. A ring-shaped inflatable balloon between the fore and aft sections of the drilling head forms a fluid-tight seal between the inner wall of the tunnel and the exterior of the drilling head to provide controlled hydrostatic fluid pressure at the tunnel heading.

3,778,108

TRONA MINING METHOD

James Ronald Pennington, Basking Ridge, N.J., and Errol Murray Gardiner, Green River, Wyo., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Feb. 29, 1972, Ser. No. 230,415
Int. Cl. E21c *41/08*
U.S. Cl. 299—11 **3 Claims**



In the mining of a substantially horizontal bed of trona, stronger than the overlying and underlying strata, the method of driving substantially parallel entries into the trona formation, connecting said entries by at least one primary passage thereby defining the main trona pillar to be mined, supporting the roof of a primary passage by means of a movable roof supporting structure and mining the exposed face of the trona pillar under the protection of the roof supporting structure, removing the mined material and advancing the supporting structure so that it remains essentially adjacent and parallel to the mine face as it recedes, continuously advancing the roof supporting structure to incrementally effect caving of the previously supported roof and continuing the mining of the exposed face of the trona pillar under the protection of the roof supporting structure, removing the mined material and advancing the supporting structure so that it remains essentially adjacent and parallel to the mined face as it recedes.

3,778,109

LOW-NOISE PROCESS FOR PAVEMENT FRAGMENTATION

Philip J. Anderson, Deerfield, Ill., and James W. Daily, College Park, Md., assignors to The Institute of Gas Technology, Chicago, Ill.

Filed May 17, 1972, Ser. No. 254,156
Int. Cl. E01c *23/09*
U.S. Cl. 299—14 **4 Claims**

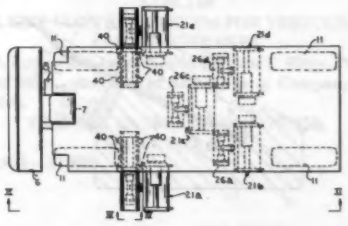
A low noise method of fragmenting pavement wherein a continuous free surface delineating the area within which the pavement is to be fragmented is created. Thereafter, the pavement within this delineated area is pre-weakened by fracturing it. While the continuous free surface and the pre-weakening of the pavement within this delineated area can be accomplished in numerous different ways, it is preferred to use microwave energy to fracture and pre-weaken the pavement. After having pre-weakened the pavement, the pavement is impacted with a series of water slugs or jets which pressurize all or part of the fracture network displacing or unkeying the pavement fragments bounded by these fractures so as to facilitate their removal. The displaced pavement fragments then can be removed by conventional means, such as shoveling. By pre-weakening the pavement in the above-described fashion, and then pressurizing all or part of the fracture network with a series of water slugs or jets, the energy required is far less and the breakage rate is far greater.

3,778,110

SUPPORTING CUTTER ASSEMBLIES FOR MULTIPLE GROOVING OF PAVEMENT

Donald C. Staab, Warrington, Pa., assignor to Cardinal Industries, Incorporated, Conshohocken, Pa.

Filed Dec. 27, 1971, Ser. No. 212,253
Int. Cl. E01c *23/09*
U.S. Cl. 299—39 **10 Claims**



Vehicular apparatus for multiple grooving of pavement is provided with ganged cutter assemblies, certain of which are stowable inboard when not in use and are movable to outboard use positions as desired. A preferred ganging has a W-shaped plan, with a cutter assembly located at each apex and each end of the W.

3,778,111

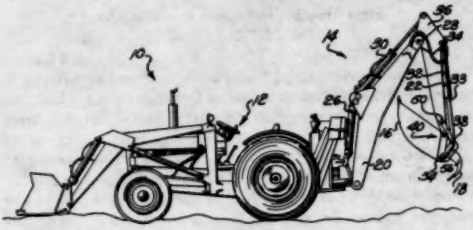
RIPPER TOOTH ATTACHMENT FOR A BACKHOE

Pio Antonio Clofani, Richmond Heights, Ohio

Filed Mar. 27, 1972, Ser. No. 238,573
Int. Cl. E02f *3/76*
U.S. Cl. 299—67 **15 Claims**

A ripper tooth attachment for a backhoe having a bucket pivotably mounted on a boom, hydraulic means for rotating the bucket relative to the boom and a linkage pivotably connecting the hydraulic means and the bucket. The ripper tooth attachment comprises a sharpened end portion for engaging material to be ripped and a support member which is connected to the linkage for movement therewith and which supports the sharpened end portion in a position substantially per-

pendicular to the linkage. Upon actuation of the hydraulic means the bucket is pivoted between an operative and inoperative position. When the bucket is in an operative position, the linkage is disposed so as to position the ripper tooth in an inoperative position and when the bucket is moved to its



inoperative position the linkage is disposed to support the ripper tooth in an operative position. This arrangement enables the ripper tooth and the bucket to be simultaneously mounted on the backhoe and moved between their operative and inoperative positions by merely actuating the hydraulic means of the vehicle.

3,778,112

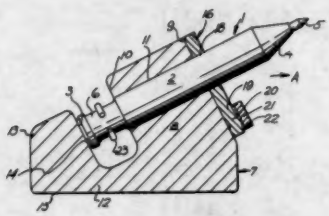
ANTI-CORING DEVICE FOR USE WITH BIT MOUNTING MEANS ON MINING, EARTH WORKING AND DIGGING MACHINES

Claude B. Krekeler, Cincinnati, Ohio, assignor to The Cincinnati Mine Machinery Co., Cincinnati, Ohio

Continuation-in-part of Ser. No. 842,791, June 30, 1969, Pat. No. 3,622,206, which is a continuation-in-part of Ser. No. 753,398, Aug. 19, 1968. This application Sept. 20, 1971, Ser. No. 181,771

Int. Cl. E21c *35/18*

U.S. Cl. 299—86 **8 Claims**



An anti-coring device to protect the bit mounting means on a mining machine, digging machine, earth working machine or the like. The anti-coring device comprises a replaceable member detachable affixed at the forward face of the mounting means and configured with respect to the mounting means to be subjected to the wear by cores which would normally be sustained by the mounting means. In certain embodiments, the anti-coring device will be provided with a notch or perforation through which the bit passes, so that support for the anti-coring device can be provided in part at least by the bit.

3,778,113

ROCK BREAKING EQUIPMENT

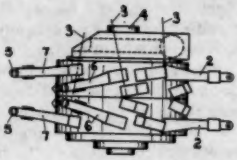
Richard F. Taylor, Johannesburg, Transvaal Province, Republic of South Africa, assignor to Anglo-Transvaal Consolidated Investment Company Limited, Johannesburg, Transvaal, Republic of South Africa

Filed Feb. 29, 1972, Ser. No. 230,246

Int. Cl. E21c *37/18*

U.S. Cl. 299—86 **6 Claims**

Rock breaking equipment which utilize a rotor carrying pivoted hammers thereon wherein the axes of the pivots for the hammers are offset from and inclined to the axis of the rotor. The hammer pivots are inclined to the plane at right angles to the axis of the rotor at an angle of 45 degrees and this



construction provides a nested assembly of hammers and also the possibility of the hammer striking path lying outside the physical boundaries of the rotor and drive assembly.

3,778,114

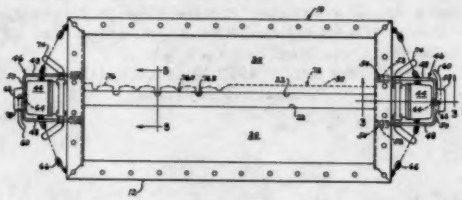
HOPPER OUTLET STRUCTURE FOR PNEUMATIC UNLOADING

John L. Carney, Jr., and Richard H. Dugge, both of St. Louis, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed July 19, 1971, Ser. No. 163,702

Int. Cl. B65g *53/40*

U.S. Cl. 302—52 **6 Claims**



A pneumatic bottom discharge outlet for a covered hopper railway car having a lower fixed tubular conduit for the discharge of lading and a rotatable valve member for controlling the flow of lading into the conduit. The valve member comprises an arcuate segment positioned between the lower portions of the sloping outlet side walls and having end portions extending beyond the outlet end walls. The end portions of the valve member are suspended in secured relation to rotatable sleeves mounted on end rings fixed to the end walls. The inner surface of the end rings form a continuation of the smooth bottom of the tubular conduit without any obstruction thereby to provide an even flow path for the discharge of lading.

3,778,115

PNEUMATIC BRAKE SYSTEM

Kenneth D. Ryburn, Chillicothe; Robert J. McClone, and Charles H. Fox, both of Washington, all of Ill., assignors to Westinghouse Air Brake Company, Pittsburgh, Pa.

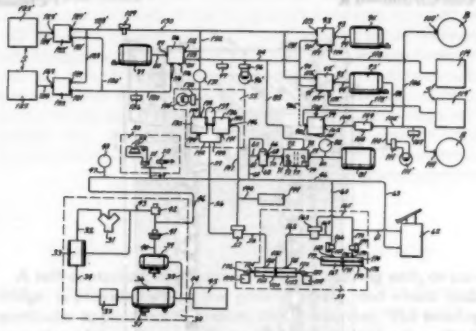
Division of Ser. No. 108,579, Jan. 21, 1971, Pat. No. 3,702,715. This application June 8, 1972, Ser. No. 261,120

Int. Cl. B60t *7/00;* **B60t** *17/04*

U.S. Cl. 303—3 **7 Claims**

A pneumatic brake system for an electrically driven vehicle having conventional service and novel parking brakes, which system integrates a service braking system, a dynamic braking system, an emergency braking system, and a parking braking system for selective and automatic application. The dynamic and service brakes are controlled by a brake application valve having a foot treadle adapted for engagement by the vehicle operator and connected in tandem with service and dynamic

braking valves so that upon initial engagement of said treadle dynamic braking is effected and upon further engagement service braking is effected. The emergency brake system is operated automatically through the use of emergency relay valves upon attainment of a predetermined air pressure within



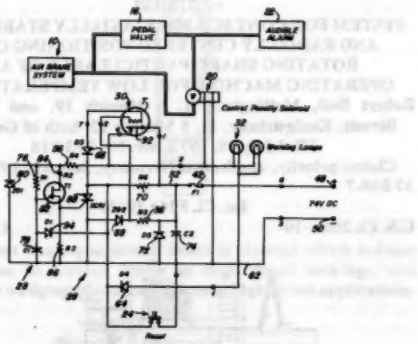
the brake system and includes a brake reapplication system which may be employed to release and then reapply the service brakes after an emergency braking conditions. The parking brake is of the spring operated, air pressure released type and is adapted for independent application by a manual control valve disposed within the parking brake line.

3,778,116

SAFETY DEVICE REQUIRING PERIODIC ATTENTION OF VEHICLE OPERATORS

Leroy P. Kennedy, 5118 Hathaway Dr., S.W., Roanoke, Va.

Filed Apr. 9, 1971, Ser. No. 132,730
Int. Cl. B60t 7/14
U.S. Cl. 303—19 **6 Claims**



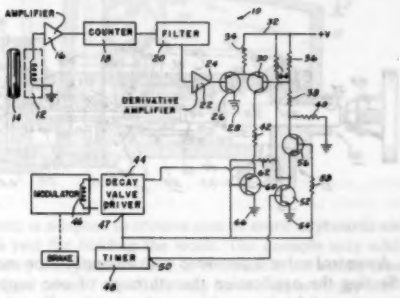
The control penalty solenoid of an air brake system is maintained energized during a first timing cycle of a control circuit and during a second timing cycle of a time delay relay through which the control circuit and solenoid are energized from a voltage source. Completion of the first timing cycle initiates the second timing cycle during which a warning device alerts the operator. Normal actuation of a reset switch by the operator before completion of the second timing cycle, prevents the energization of the solenoid.

3,778,117

SIMPLIFIED ADAPTIVE BRAKING LOGIC

James M. Needham, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Feb. 22, 1972, Ser. No. 227,748
Int. Cl. B60t 8/12
U.S. Cl. 303—21 CG **10 Claims**



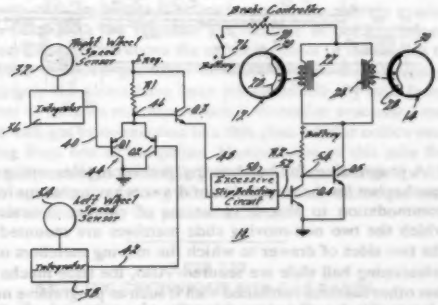
An adaptive braking system for a wheeled vehicle is described which includes the usual control circuitry which senses an incipient skidding condition in a corresponding vehicle wheel and which then actuates a modulator to relieve braking pressure in the corresponding brake. The control circuitry includes a comparator which actuates the modulator and a timer circuit when wheel deceleration reaches a predetermined reference level. The timer circuit produces a signal for a predetermined time period after its initial actuation. The signal from the timer switches the reference level of the comparator and also inhibits the output of the latter after termination of the comparator output within the predetermined time period.

3,778,118

WHEEL SLIP CONTROL SYSTEM FOR VEHICLES WITH ELECTRIC BRAKES

Robert S. Podlewski, Jackson, and William T. Birge, Plymouth, both of Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

Filed Sept. 13, 1971, Ser. No. 179,858
Int. Cl. B60t 8/10
U.S. Cl. 303—21 EB **3 Claims**



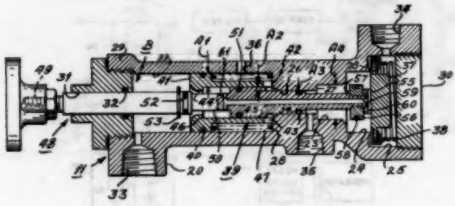
A wheel slip control system for a wheeled vehicle having an electrically operated brake for at least one wheel thereof and an electric brake controller for modulating the actuation of the brake which includes a wheel speed sensor for the wheel, a detector for detecting an incipient excessive slip condition, and means for relieving brake actuation upon the detected occurrence of an incipient excessive slip condition.

3,778,119

CONTROL VALVE

Raymond J. Kersting, Dellwood, Mo., assignor to Wagner Electric Corporation, Newark, N.J.

Filed Aug. 24, 1971, Ser. No. 174,340
Int. Cl. B60t 15/02
U.S. Cl. 303—68 27 Claims



A control valve is provided with an application member for effecting the application therethrough of one supplied fluid pressure and driving a valve member to also effect the application through said control valve of another supplied fluid pressure, said application and valve members being movable toward positions isolating the one and other supplied fluid pressures and exhausting the applied fluid pressures, and resiliently urged means is provided to drive said application member to its isolating position in response to the reduction of the one supplied fluid pressure to a value less than a predetermined value.

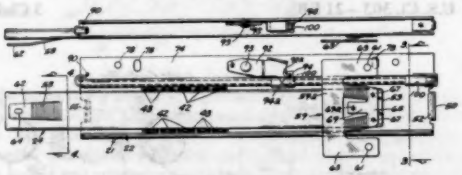
This invention relates generally to control valves and in particular to a control valve for use in a fluid pressure system to control a spring set brake actuator thereof.

3,778,120

PRECISION TELESCOPING BALL BEARING DRAWER SLIDE SUSPENSION FOR WOOD AND METAL FURNITURE PRODUCTION

Magnus F. Hagen, 3713 Twilight Dr., Fullerton, Calif., and Fred H. Jordan, 14906 Lodosa, Whittier, Calif.

Filed Feb. 15, 1972, Ser. No. 226,424
Int. Cl. F16c 21/00
U.S. Cl. 308—3.8 7 Claims



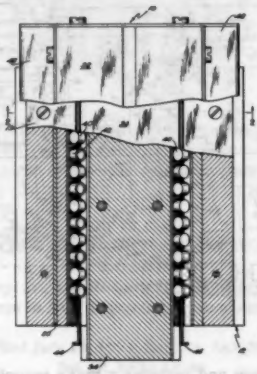
A progressive, full ball bearing, precision, telescoping slide mechanism for the suspension of drawers having means for accommodation to absorb variations of cabinet structure to which the two non-moving slide members are mounted and the two sides of drawer to which the moving members of the telescoping ball slide are secured. Also, the slide mechanism has other features combined with it such as progressive movement, and/or an adaptor attached to the drawer to provide simple attachment without tools to the drawer and to permit the drawer to be easily — without tools — removed from the slide when it is desired to do so, and readily reinserted, or interchanged with other drawers. Another feature is a combination of stops which will absorb any metal clicking noise at times of opening or closing of drawer, thus, contributing to the elimination of today's harmful "noise pollution" modern office ecology is exposed to.

3,778,121

SLIDE GUIDE HAVING PRELOADED HOLLOW AND SOLID ROLLER BEARINGS

George N. Levesque, Warwick, R.I., assignor to Brown & Sharpe Manufacturing Company, North Kingstown, R.I.

Filed Nov. 18, 1971, Ser. No. 199,993
Int. Cl. F16c 29/00
U.S. Cl. 308—6 R 7 Claims



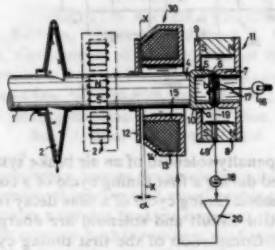
A machine slide having a support member and a carriage member movable on said support. One of said members having a channel formed in it and the other member having a guide tongue that extends into the channel. Raceways are formed along the inner surfaces of the channel opposite surfaces of the guide tongue. Roller bearings have a portion of their circular surfaces in bearing contact with the raceways and also a portion of their circular surfaces in bearing contact with the wall surfaces of the guide tongue which are opposite the raceways. The roller bearings are comprised of both solid rolls and hollow rolls. The distance between all the opposite surfaces upon which the hollow rolls bear when assembled is less than the diameter of the hollow rolls whereby when the hollow rolls are positioned in place between their opposite bearing surfaces they are compressed between said bearing surfaces to strain them and pre-loaded solid rolls.

3,778,122

SYSTEM FOR CONTACT-FREE, AXIALLY STABILIZED AND RADIALLY CENTERED POSITIONING OF A ROTATING SHAFT, PARTICULARLY OF AN OPERATING MACHINE FOR LOW TEMPERATURES

Robert Doll, Mettinghstr. 1, 8 Munich 19, and Hartmut Berndt, Konigsteinstr. 11, 8 Munich 13, both of Germany

Filed July 19, 1972, Ser. No. 273,318
Claims priority, application Germany, July 29, 1971, P 21 37 850.7
Int. Cl. F16c 39/06
U.S. Cl. 308—10 12 Claims



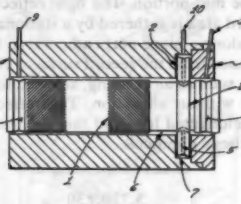
A system for contact-free, axially stabilized and radially centered positioning of a rotating shaft, particularly of an operating machine for low temperatures.

3,778,123

LIQUID BEARING UNIT AND SEAL

Harvey S. Hendler, Wayne; William C. Albert, Boonton, and John Evans, Oakland, all of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Nov. 17, 1971, Ser. No. 199,619
Int. Cl. F16c 33/72
U.S. Cl. 308—36.3 10 Claims



A self-contained, hydrodynamic liquid bearing unit, or cartridge, is provided which has general utility, and which finds particular application in present day gyroscopes. The bearing cartridge of the invention, in the embodiment to be described, includes a journal member rotatably contained in a bore in a housing, and a layer of bearing fluid separating the journal member from the inner peripheral surface of the bore. Rotary seals of a non-wetting liquid, such as mercury, are provided at each end of the cartridge to segregate the bearing from the other elements of the instrument in which it is incorporated. When the liquid bearing cartridge of the invention is used in a gyroscope, for example, the rotor of the gyroscope is able to run in a stable vacuum with virtually no power losses due to windage effects.

3,778,124

SEPARATOR INSERT FOR THRUST BEARINGS

Richard L. Alling, Torrington, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Jan. 17, 1972, Ser. No. 218,159
Int. Cl. F16c 33/38
U.S. Cl. 308—235 4 Claims

A thrust bearing separator insert is claimed which reduces wear due to inertial forces in high speed bearings, and prevents wedging of retainer halves in high thrust applications.

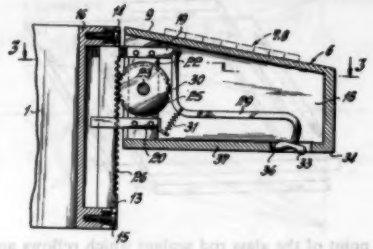
3,778,125

OFFICE MACHINE WORKTABLE CONSTRUCTION

Karl Gutmann, Jr., Unterkirnach/Schw., and Joachim Meinherz, Paderborn, both of Germany, assignors to Firma Karl Gutmann AG, Talstrasse, Germany

Filed Aug. 6, 1971, Ser. No. 169,746
Claims priority, application Germany, Apr. 7, 1970, P 20 16 413.0; Apr. 7, 1970, P 20 16 412.9
Int. Cl. A47b 21/00, 51/00
U.S. Cl. 312—272.5 6 Claims

A worktable particularly for data processing systems which includes one or more keyboards and mechanical or electronic parts of the system which are arranged separate from one another, comprises a table having a support for a printing unit and a console which is carried at the front of the table adjacent the printing unit and mounted for movement vertically.



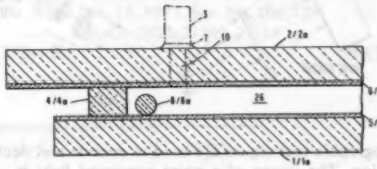
The console is adapted to receive one or more keyboards and to have a rest for holding the work. The console may additionally carry a keyboard which is extendable outwardly from the front face thereof or, which may be moved inwardly into a recessed or completely withdrawn obscured position.

3,778,126

GAS DISPLAY PANEL WITHOUT EXHAUST TUBE STRUCTURE

Donald Miller Wilson, Kingston, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1971, Ser. No. 214,174
Int. Cl. H01j 9/38
U.S. Cl. 316—20 10 Claims



Projecting exhaust tube constructions of earlier gas panels are eliminated by the disclosed process. In the present method an unfused low-softening-point glass sealant, arranged in a picture frame pattern, is sandwiched loosely between aligned flat glass plates, and the disjoint assembly is placed in a vacuum oven enclosure. The enclosure is successively evacuated, filled with the requisite gas mixture at predetermined pressure and heated above the softening point of the sealant to establish a sealed gas-filled envelope within the assembly. Previously the plates have been joined initially by heat fused sealant to form an envelope which is thereafter evacuated and filled with gas by connection to a thin glass tubular orifice projecting from one of the plates. Manipulation of this tube for evacuation and gas back-filling of the envelope, which is a difficult operation requiring considerable time, technique and skill, is eliminated by the present method.

3,778,127

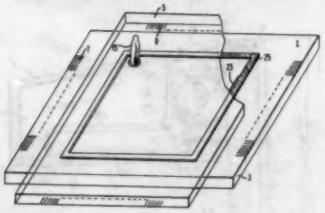
SEALING TECHNIQUE FOR GAS PANEL

Perry R. Langston, Jr., Poughkeepsie; Rao R. Tummala, Wappingers Falls, and Donald M. Wilson, Kingston, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1971, Ser. No. 214,298
Int. Cl. H01j 9/38
U.S. Cl. 316—20 6 Claims

In a method for sealing a gaseous display and/or memory device, an unfused, low-softening point glass rod sealant, ar-

ranged in a picture frame pattern, together with high-softening point glass spacing rods are positioned between a pair of aligned flat glass plates, and the resulting assembly is placed in an oven enclosure. The assembly is then heated above the sof-



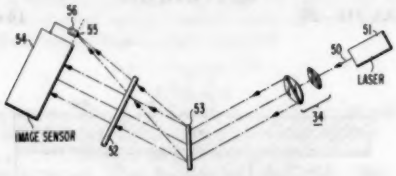
tening point of the glass rod sealant which reflows and fuses the plates to establish a gas-filled envelope. As the sealing material softens, the upper plate settles u;on the spacing rods to thus establish a predetermined and uniform spacing within the envelope.

3,778,128

GATED HOLOGRAPHIC CODING SYSTEM FOR REDUCING ALIGNMENT REQUIREMENTS

William James Hannan, Pennington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 30, 1972, Ser. No. 257,680
Int. Cl. G02b 27/00
U.S. Cl. 350—3.5 **2 Claims**



Holographic techniques are used to encode and decode information. The image of a point source of light is used to trigger an image sensor into detecting the decoded information when the relative encoding coordinates between a code plate and hologram are reestablished in a decoding apparatus.

3,778,129

OPTICAL SCANNER

Ernest Wildhaber, 124 Summit Dr., Rochester, N.Y.

Filed Aug. 31, 1972, Ser. No. 285,515
Int. Cl. G02b 17/00
U.S. Cl. 350—6 **12 Claims**

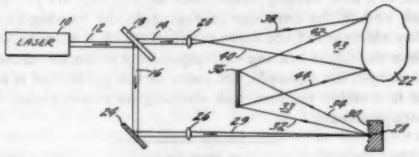
This optical scanner uses a rotor with lenses. The lens surfaces are special and made up of surface elements parallel to the rotor axis. Preferably the source of light is a laser emitting very nearly parallel light rays. The rays are directed through a narrow line-like area that may lie on the rotor axis, and that emits a narrow fixed light bundle. A rotor lens forms an image of said line-area on a record. The thus illuminated area moves along a character line of the record as the rotor turns. To cover the entire length of a line of characters with the fixed narrow light bundle, the lens profile in a plane perpendicular to the rotor axis has a varying curvature. Its curvature radius is smallest in the mid-portion. The light reflected from the illuminated record area is gathered by a stationary elongated lens that extends along a plane perpendicular to the rotor axis at a constant distance from the record surface. This elongated lens has a portion, such as an opening, adapted to let the incoming light through without alteration. The reflected light passing through said elongated lens and through the adjacent lens of the rotor reaches a photocell.

3,778,130

HOLOGRAM FORMATION WITH A SPECKLE REFERENCE POINT SOURCE

James P. Waters, Rockville, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 30, 1972, Ser. No. 239,737
Int. Cl. G02b 27/00
U.S. Cl. 350—3.5 **7 Claims**



Disclosed are hologram systems in which the necessary degree of vibration isolation of the object being recorded is substantially less than is required in conventional holographic systems. A source beam is divided into a first beam and a second beam: the first beam is expanded and directed onto the object being recorded to form an object bearing beam; the second beam is focused onto a diffusely scattering surface to form a reference beam that self compensates for vibratory motion of the object.

3,778,131

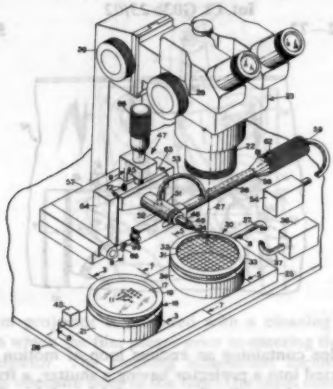
APPARATUS FOR MICROSCOPICALLY INSPECTING OPPOSITE SIDES OF OBJECTS

William R. Wanesky, Wescosville, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.

Division of Ser. No. 30,379, April 21, 1970, Pat. No. 3,680,947. This application May 18, 1972, Ser. No. 254,436
Int. Cl. G02b 21/00
U.S. Cl. 350—81 **4 Claims**

Microscopic inspection of objects such as beam-lead integrated circuits is accomplished by positioning the objects mounted on platforms in a spaced relationship under a vacuum pickup needle located in the field of view of the microscope. Rapid and accurate positioning is aided by air bearing facilities. One of the platforms includes a transparent disc for supporting the bottom sides of the objects. The disc is parallel to and spaced from a mirror which reflects an image of the bottom sides to the microscope. The microscope is first raised to its upper position along its principal axis and focused on the top sides of the objects so that the mirror image of the bottom sides is out of focus and not visible. The top sides are then individually inspected. Next, the microscope is moved to its lower position along its axis and then focused on the mirror image of the bottom sides of the objects so that the top sides

are out of focus. Preferably, the magnification of the microscope while in its lower position is increased to provide a larger image of the bottom sides to thereby facilitate their inspection. The increasing of the magnification also decreases the depth of field of the microscope so that an image of the top sides is far out of focus and therefore not visible. This improves the clarity of the image of the bottom sides to further facilitate their inspection. The bottom sides are then individually inspected. During the inspection the objects are separated in accordance with certain characteristics with the aid of a vacuum pickup needle. The movement of the needle is limited by a ball plunger to prevent damage to the objects.



3,778,132

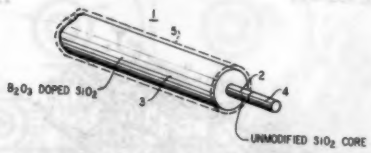
OPTICAL TRANSMISSION LINE

Douglas Arthur Pinnow, Berkeley Heights; Legrand Gerard Van Uitert, Morris Township, and John Charles Williams, Whippany, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Oct. 6, 1972, Ser. No. 295,718

Int. Cl. G02b *5/14*

U.S. Cl. 350—96 WG **12 Claims**



Optical transmission lines suitable for transmitting electromagnetic radiation within the visible spectrum and adjoining portions of the infrared and ultraviolet spectra consists of a pure amorphous silica core clad by a B_2O_3-modified silica cladding. The cladding may manifest a substantial uniform refractive index of a value at least 0.1 percent less than that of the core or may be graded to such a lowered value.

3,778,133

LENS SYSTEM HAVING AT LEAST ONE THIN, HIGHLY DEFORMED PLATE WITH ASPHERICAL SURFACES

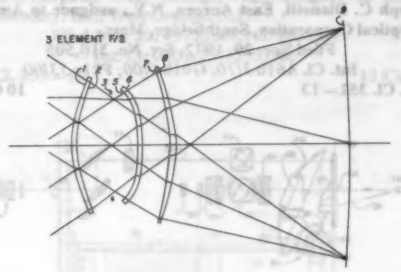
Berge Tatian, Stoneham, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed July 26, 1972, Ser. No. 275,276

Int. Cl. G02b *3/04, 9/12, 13/14*

U.S. Cl. 350—2 **11 Claims**

Four embodiments of fast (F/2 or faster), wide angle (70°), infrared lens systems are disclosed. Each of the lens systems is formed of a plurality of thin, highly deformed germanium plates. Each highly deformed plate has two, substantially parallel, highly deformed aspheric surfaces. The high index of



refraction of germanium generates the power in each lens system despite the substantially parallel nature of the aspheric surfaces of each plate, and the aspheric surfaces are utilized for the correction of aberrations.

ERRATUM

For Class 351—13 see:
Patent No. 3,778,135

3,778,134

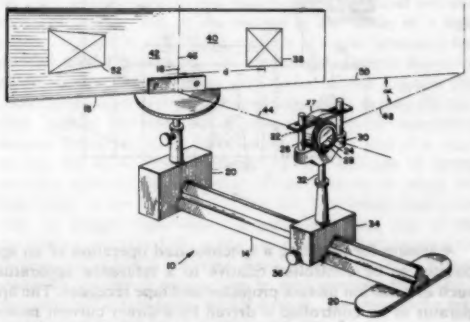
REFLECTIVE HALF-LENS RECTIFIER

Brian H. Welham, Fairport, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Jan. 15, 1971, Ser. No. 106,729

Int. Cl. G03b *21/00, 21/14*

U.S. Cl. 353—5 **5 Claims**



A photograph or other graphical display having a tilted image is illuminated on an input stage which is coplanar with an output stage. Apparatus for the removal or inducement of distortions in various kinds of terrestrial photographs and other graphics. In such apparatus reflective half-lens is arranged for arcuate motion about a pivot point located coplanar with the input and output stages. Rays emanating from the input photograph are passed through the lens to a mirror, reflect from the mirror and are passed through the lens again to form an image on the output stage, which image may be a unit-magnification, rectified image of the input photograph if the lens has first been suitably adjusted along its arcuate path. Alternately, the lens may be fixed in position and the input-output stages let to pivot about the pivot point.

3,778,135

OPHTHALMOMETER HAVING ALTERNATIVE VIEWING AND MEASURING SYSTEMS AND INCLUDING AN IMPROVED ILLUMINATION SYSTEM

Joseph C. Dianetti, East Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Nov. 29, 1972, Ser. No. 310,505
Int. Cl. A61b *3/10*; G01b *9/00*; F21v *33/00*
U.S. Cl. 351—13 10 Claims

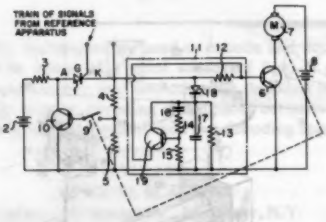
Ophthalmometer including a measuring circuit for measurement of the curvature of the cornea and contact lens curvatures with a built-in viewing circuit which is activated by the movement of a lever to allow visible inspection of the cornea and contact lenses. An interference ultraviolet filter in communication with a single light source permits the cornea to be viewed under ultraviolet light as well as ordinary visible light.

3,778,136

PULSE SYNCHRONIZING SYSTEM FOR MOTION PICTURE APPARATUSES

Torataro Takahashi, Gifu, Japan, assignor to Elmo Company Limited, Mizuho-ku, City of Nagoya, Aichi Prefecture, Japan

Filed Sept. 18, 1972, Ser. No. 289,882
Claims priority, application Japan, Sept. 23, 1971, 46/87071
Int. Cl. G03b *31/04*
U.S. Cl. 352—17 6 Claims



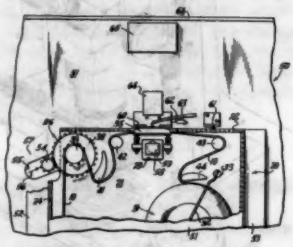
A system for effecting a synchronized operation of an apparatus to be controlled relative to a reference apparatus, such as a motion picture projector and tape recorder. The apparatus to be controlled is driven by a direct current motor connected in series with a direct current source under the control of a transistor connected thereto, and the reference apparatus causes a train of turn-on pulse signals to be produced at a recurrence rate proportional to a predetermined speed of the apparatus to be controlled. The system circuit has a thyristor having a gating electrode, an anode and a cathode, the train of turn-on pulse signals being applied to the gating electrode of the thyristor to turn it on, and the above transistor being connected to the cathode of the thyristor and turned on when the thyristor is made conductive by the train of turn-on pulse signals. The apparatus to be controlled is driven only when the transistor is in the conductive state and operates a switching circuit to produce a train of turn-off pulse signals at a rate proportional to the speed thereof, so that the thyristor is turned off at intervals which are determined by one of the train of turn-on pulses and a successive one of the train of turn-off pulses.

3,778,137

CARTRIDGE-LOADED SOUND MOTION PICTURE PROJECTION

Peter J. Castellano, Deer Park, and Jerry H. Galuten, Elmhurst, both of N.Y., assignors to Audio-Optics Corporation, New York, N.Y.

Division of Ser. No. 65,869, Aug. 21, 1970. This application Sept. 25, 1972, Ser. No. 292,116
Int. Cl. G03b *23/02*
U.S. Cl. 352—72 5 Claims



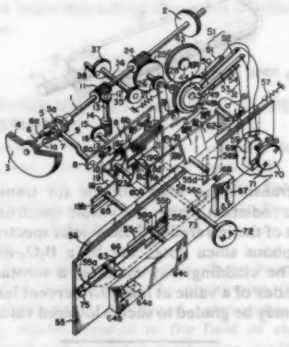
A cartridge containing an endless loop of motion picture film is inserted into a projector having a shutter, a frame advancing claw and a resiliently mounted drive pinion. The cartirdge includes a drive wheel mounted in an opening therein which cooperates with the drive pinion of the projector for continuously advancing the film mounted in the opening. The resiliently mounted drive pinion is positioned in the projector so that it is beyond the dead center position of the drive wheel when the cartridge is fully inserted into the projector for holding the same in place.

3,778,138

SPECIAL PHOTOGRAPHING DEVICE FOR A CINECAMERA

Yozo Iida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Sept. 22, 1971, Ser. No. 182,667
Claims priority, application Japan, Sept. 30, 1970, 45/85419
Int. Cl. G03b *21/36*
U.S. Cl. 352—91 15 Claims



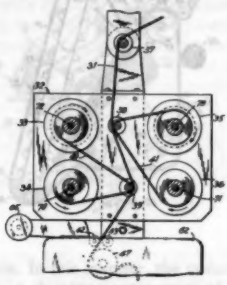
A photographing device incorporated in a cinecamera having means to control the output of an electric drive motor either by selecting forward or reverse circuits for the motor or by actuating a mechanical clutching mechanism. Film metering means and exposure opening varying means are coordinated with the drive motor output control means for effecting various modes of special photography with the camera, including normal exposure, double exposure, overlap exposure, automatic fade-out, automatic fade-in and reverse exposure.

3,778,139

FILM PROJECTION WITH CLEANING ATTACHMENT

Joseph Kelly, 128 Turtlecove Ln., Huntington, L. I., N.Y.

Division of Ser. No. 809,620, March 24, 1969, Pat. No. 309,020. This application Nov. 4, 1970, Ser. No. 87,006
Int. Cl. G03c 11/00
U.S. Cl. 352—130 3 Claims



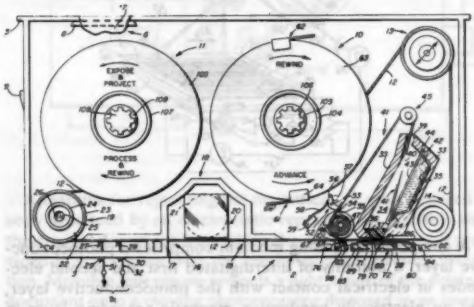
A film projector is provided with a cleaning attachment through which the film passes prior to entering the interior of the projector. The cleaning attachment includes cleaning tapes on opposite sides of the film. The tapes contact the film at spaced positions. The tapes are driven in opposite direction to that of the film.

3,778,140

PHOTOGRAPHIC SYSTEM COMPRISING FILM CASSETTE INCLUDING SELF-CONTAINED PROCESSING APPARATUS AND FILM DRIVE AND PROJECTION SYSTEM CONTROLLED THEREBY

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 17, 1972, Ser. No. 227,082
Int. Cl. G03c 11/00
U.S. Cl. 352—130 10 Claims



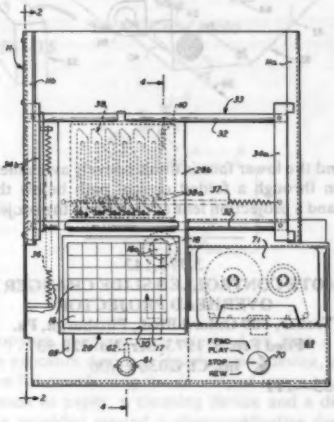
A photographic system comprising a self-processing film cassette containing a film strip transferable between takeup and supply reels by way of a film gate. A processor is enclosed within the cassette and responds to film position and direction of motion to process exposed film during its passage from takeup to supply reels. An electrical signal generator is located in the housing and responds to the processed or unprocessed state of the film to produce an external signal for selecting the mode of operation of a film drive and projection system adapted to receive the cassette. The film drive and projection system comprises a cyclic drive system, for selectively advancing the film onto the takeup reel and then rewinding it onto the supply reel; a projection lamp; a lens; and a selectively operable shutter for the lens. If the film is unprocessed, the projection system will process it with the lens closed and lamp off, and then project the processed film and rewind it. If the film is processed, it will simply be projected and rewound.

3,778,141

AUTOMATIC ADVANCE MECHANISM FOR MICROFICHE READER

Joseph Peterpaul, West Orange, N.J., assignor to E.R.E. Laboratory, Inc., West Orange, N.J.

Filed June 22, 1972, Ser. No. 265,389
Int. Cl. G03b 23/12, 31/06
U.S. Cl. 353—15 11 Claims



A microfiche reader keyed to a tape recorder includes a platen receiving a microfiche having a series of images or frames arranged in successive parallel rows and columns. The platen is mounted slidably on a carriage for movement laterally of the reader in the direction of a row or X axis of the microfiche and the carriage is in turn mounted slidably on a chassis for movement front-to-back in the direction of a column or X axis of the microfiche. The platen and carriage are each spring-biased in one direction of their travel into end positions placing one of the images in the beam of a light source. A track in a face of the platen of a grid formation has parallel track sections for the respective columns interconnected at the ends. A guide pin on the chassis engages this track and a pawl-rack mechanism is operable to step the carriage against the force of its return spring by successive images. When the guide pin has reached the end of a track section the pawl is disengaged and the carriage is spring returned and the platen spring shifted sidewise to place the first image of the next column into the light beam, and so on until all images have been scanned. When the end of the microfiche is reached the guide pin is disengaged causing the carriage to be spring returned home and the platen is shifted manually against its spring bias to start position after which the guide pin is reengaged with the track. The microfiche may then be replayed or be replaced by another.

3,778,142

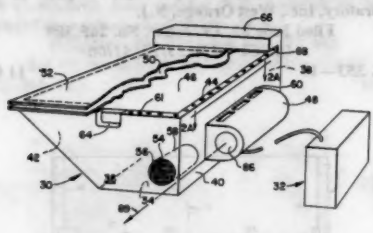
LOW PROFILE EPISCOPIC PROJECTOR AND OPAQUE MATERIALS THEREFOR

Gerald Altman, Newton Centre, Mass., assignor to Norsid Industries, Inc., Waltham, Mass.

Continuation-in-part of Ser. Nos. 780,313, Dec. 2, 1968, abandoned, and Ser. No. 742,423, July 3, 1968, Pat. No. 3,614,199. This application Oct. 19, 1970, Ser. No. 81,987
Int. Cl. G03b 21/132, 21/06
U.S. Cl. 353—44 4 Claims

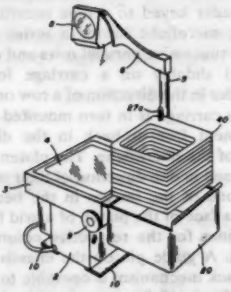
A portable episcopic projector, in which the presence of elevated optics in front of the screen is avoided, uses opaque sheeting that is adapted to receive related graphic matter on

its upper and lower faces. Simultaneously, the upper face is unobstructedly available for direct observation and manual



access, and the lower face is unobtrusively available for image projection through a folded optical path below the opaque sheeting and a projection lens at the side of the projector.

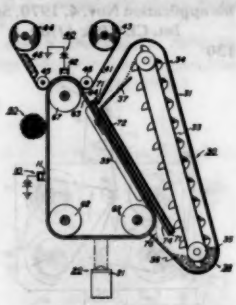
3,778,143
REMOTE CONTROLLED SLIDE CHANGER FOR OVERHEAD PROJECTOR
James E. Treher, 609 Oxford Blvd., Pittsburgh, Pa.
Filed Feb. 5, 1973, Ser. No. 329,537
Int. Cl. G03b *23/06*
U.S. Cl. 353—111 **9 Claims**



A remotely-controlled transparency slide changer moves a stack of slides on a spindle in an arc from a position clear of the top of the light box of an overhead projector to a position over the light box, releases the lowermost slide from the stack and returns to its starting position while at the same time a sweep arm moves in the reverse direction to remove a previously exhibited slide from a position over the top of the light box to a position where said slide is clear of the light box and slides down the said spindle into a receiving tray. The upper part of the spindle non-rotatably but slidably receives each of the slides in the stack but the lower part of the spindle is slidably and rotatably received in the exhibited slides.

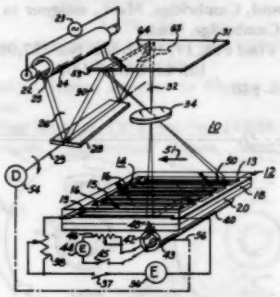
3,778,144
XEROGRAPHIC DEVELOPMENT ELECTRODE APPARATUS
Frederick W. Hudson, West Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Aug. 18, 1971, Ser. No. 172,839
Int. Cl. G03g *15/08*
U.S. Cl. 355—3 DD **4 Claims**

Improved xerographic development electrode apparatus for eliminating the problem of clogging of developer composition in the development zone associated with high speed development. The development electrode comprises a plurality of taut



parallel spaced elongated wire electrodes supported by a housing element.

3,778,145
MAGNETIC IMAGING
Richard J. McClure, Altadena, Calif., assignor to Bell & Howell Company, Chicago, Ill.
Division of Ser. No. 29,583, April 17, 1970, Pat. No. 3,717,459. This application Dec. 27, 1972, Ser. No. 318,787
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 **8 Claims**

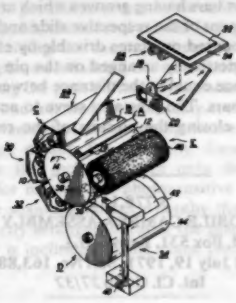


A composite recording medium comprises a photoconductive layer, a plurality of interdigitated first and second electrodes in electrical contact with the photoconductive layer, and an electrically conductive magnetic recording layer in electrical contact with the photoconductive layer. Methods and apparatus for magnetically recording an image with the assistance of this composite recording medium are also disclosed.

3,778,146
ILLUMINATING APPARATUS
Lowell W. Knapp, Victor, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Oct. 2, 1972, Ser. No. 294,064
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 **8 Claims**

An apparatus in which light rays are generated for illuminating a transparent electrode adapted to electrostatically attract

toner particles thereto. The intensity of light rays passing through the electrode indicates the density of toner particles



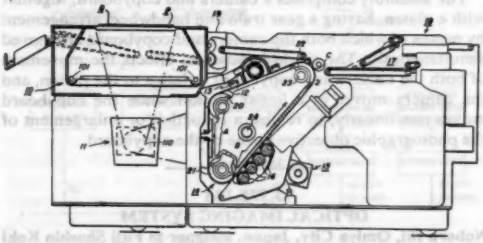
adhering thereon. In this manner, the concentration of toner particles within a development system of an electrophotographic printing machine is determined.

3,778,147

ELECTROSTATIC REPRODUCTION MACHINE HAVING SELECTABLE MAGNIFICATION RATIOS

Edward G. Reehil, Henrietta, and Gerald A. Buddendeck, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed July 11, 1972, Ser. No. 270,579
Int. Cl. G03g *15/00*
U.S. Cl. 355—8 **15 Claims**



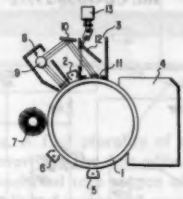
Apparatus for regulating the magnification ratio between a copy produced by an electrostatic reproduction machine and the original document from which the copy is produced is provided in accordance with the teachings of the present invention. Movable lens means projects a light image of the original document onto a moving photoreceptor disposed in an image plane, said lens means being movable along a rectilinear path to determine a magnification ratio in accordance with the relative position of said lens means with respect to said original document and said photoreceptor. Manually operable selecting means produce electrical representations of selected magnification ratios. Positioning means responds to the produced electrical representations to position the lens means at a selected location along the rectilinear path to thereby establish the selected magnification ratio. In one embodiment of the instant invention, the copy of the original document is produced by flashing a pulsed light image of the original onto the photoreceptor. Flash control means applies a flash energizing pulse to illumination means for the generation of the light pulse in timed relation with the movement of the photoreceptor. The flash control means is responsive to a preselected one of the selected magnification ratios for delaying the application of the flash energizing pulse to the illumination means for a predetermined interval of time.

3,778,148

APPARATUS AND METHOD FOR SELECTIVELY DISCHARGING THE PHOTOCONDUCTIVE SURFACE OF AN ELECTROSTATIC DRUM COPIER TO FACILITATE THE CLEANING THEREOF

Kaoru Fujitsuka, Oomiya, and Ko Honda, Iwatsuki, Saitama, both of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1972, Ser. No. 317,779
Claims priority, application Japan, Dec. 27, 1971, 46/105483
Int. Cl. G03g *15/00*
U.S. Cl. 355—15 **6 Claims**



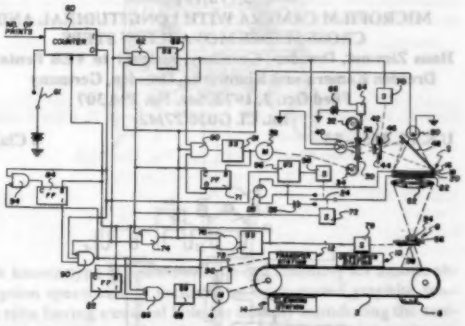
In a copying machine characterized in that a charging device, an exposure device, a development device, a transferring device for transferring the developed image to a transfer medium such as paper, a cleaning device and a discharging device are provided around a photoconductive drum in the foregoing order, the improvement comprising means for introducing a discharging light disposed next to the charging device, and a shutter which intercepts the discharging light for a time corresponding to the length of the transfer medium only when the transfer medium enters the body of the copying machine.

3,778,149

METHOD AND APPARATUS FOR MAKING MULTIPLE COPIES FROM AN ORIGINAL

Gary D. Fields, Parker, Colo., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 17, 1972, Ser. No. 227,238
Int. Cl. G03g *15/14*
U.S. Cl. 355—16 **15 Claims**



Apparatus is disclosed for making multiple copies from an original by forming a first temporary image from the original which temporary image is used to sequentially expose a plurality of photosensitive surfaces to form multiple images. Thus, while successive photosensitive surfaces are being exposed, a first original may be replaced in an exposure station with another original from which copies are to be made. Time delay is reduced since the original from which subsequent co-

pies are to be made can be positioned in the exposure station while multiple copies are being made from a temporary image formed from the first original. The temporary image is formed on a photoconductive-liquid crystal sandwich by a first source of radiation to which the photoconductive layer is sensitive, and is projected by a second source of radiation which may be within another portion of the electromagnetic spectrum to which the photoconductive layer is not sensitive.

3,778,150

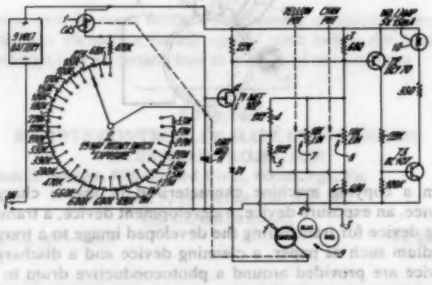
PRINTING OF PHOTOGRAPHIC COLOUR NEGATIVES

Keith Aston, 20 Summerville Gardens, Surrey, England

Filed Oct. 27, 1971, Ser. No. 192,956

Int. Cl. G03b 27/72

U.S. Cl. 355—38 **10 Claims**



Apparatus for screening photographic colour negatives to determine the exposure time and colour filtering required to produce an acceptable colour print. The apparatus incorporates a photoresistor connected in series with an adjustable resistance calibrated in terms of exposure times, the photoresistor and adjustable resistance constituting two arms of a bridge circuit. A further two arms are constituted selectably by either a fixed resistor network or by one or other of two potentiometers calibrated in terms of colour filter densities, switches being provided to enable selection. Alternatively one potentiometer appropriately switched can serve the function of the two potentiometers. A detector circuit senses balance in the bridge circuit. The calibration of the adjustable resistance and potentiometers, and the way the apparatus is used are explained.

3,778,151

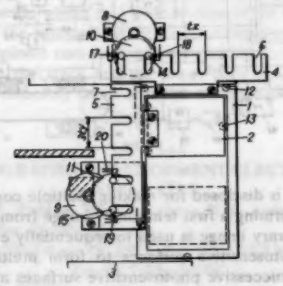
MICROFILM CAMERA WITH LONGITUDINAL AND CROSS SLIDES MOVABLE IN STEPS

Hans Zimmet, Dresden, Germany, assignor to VEB Pentacon Dresden Kamera-und Kinowerke, Dresden, Germany

Filed Oct. 2, 1972, Ser. No. 294,307

Int. Cl. G03b 27/42

U.S. Cl. 355—53 **4 Claims**



A microfilm camera includes a housing, a longitudinal slide which can be moved in steps in said housing, and a cross slide which can also be moved in steps within the housing. A cross slide is provided within the housing for carrying one film sheet at a time. To the longitudinal slide and the cross slide there are attached transport bars having grooves which are cut transversely to the movement of the respective slide and which are engaged by pins mounted on plates drivable by electric motors. The pins are diametrically arranged on the pin plates and are spaced at a distance equal to the distance between the grooves in the transport bars. The pins also serve to actuate contacts for opening and closing the circuits of the respective electromotors.

3,778,152

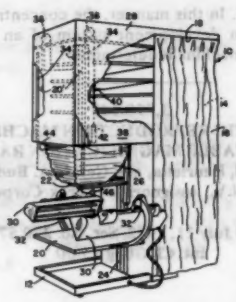
MOBILE CAMERA ASSEMBLY

Gary E. Raymond, Box 531, Kenvil, N.J.

Filed July 19, 1971, Ser. No. 163,880

Int. Cl. G03b 27/32

U.S. Cl. 355—56 **8 Claims**



The assembly comprises a camera and copyboard, together with a platen, having a gear train and handwheel arrangement by means of which both the camera and copyboard are moved simultaneously. The single handwheel effects the movement of both the camera and copyboard, relative to the platen, and the camera moves in a linear motion while the copyboard moves non-linearly, to realize a reduction or enlargement of the photographic objective borne by the copyboard.

3,778,153

OPTICAL IMAGING SYSTEM

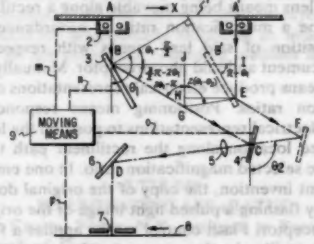
Noboru Iki, Omiya City, Japan, assignor to Fuji Shashin Koki Kabushiki Kaisha, Omiya-shi, Saitama, Japan

Filed Mar. 29, 1972, Ser. No. 239,139

Claims priority, application Japan, Mar. 31, 1971, 46/18706

Int. Cl. G03b 27/70

U.S. Cl. 355—66 **1 Claim**



An optical imaging system for image exposing a static image on a photosensitive plate comprising scanning means for progressively scanning the static object at a first speed with a light source; means for moving a first mirror in parallel in the

same direction as the scanning means at a second speed, the plane containing the first mirror being inclined with respect to the plane containing the static image; means for moving a second mirror in parallel in the same direction as the first mirror at a third speed, the second mirror facing the first mirror, the plane containing the second mirror being inclined with respect to the plane containing the static image so that the optical length along the path defined by the scanning means, first mirror and second mirror is substantially constant at all points during the movement of the scanning means, first mirror and second mirror; means for optically focusing the image reflected from the second mirror onto the photosensitive plate; means for moving the photosensitive plate at a speed relative to the scanning means whereby the imaging system can be compactly arranged because the plane containing the second mirror is inclined to the plane containing the static image.

3,778,154

METHOD OF AND APPARATUS FOR AUTOMATICALLY CONTROLLING THE SPEED AT WHICH AN ORIGINAL AND COPYING MATERIAL PASS THROUGH A COPYING MACHINE

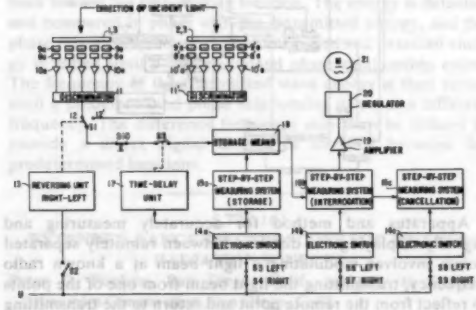
Werner Dennhardt, Bleidenstadt, and Herbert Schroter, Hahn/Taunus, both of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Apr. 20, 1972, Ser. No. 245,713

Claims priority, application Germany, Apr. 22, 1971, P 21 19 373.7

Int. Cl. G03b *27/72*

U.S. Cl. 355—68 **24 Claims**



This invention relates to an electronic method of automatically controlling the speed of a motor used to pass an original and copying material, on which an image of said original is to be produced, through the exposure zone of a copying machine, successive originals continuously passing through the machine in a manner such that a succeeding original gives rise to a speed-determining signal before a preceding original has left the exposure zone, which comprises storing a signal until the preceding original has left the exposure zone, interrogating the said signal for the purpose of controlling the speed of the motor for the period during which the said succeeding original is passed through the exposure zone, and cancelling the interrogated signal. This invention also relates to an apparatus for performing the method.

3,778,155

METHOD AND APPARATUS FOR REDUCING OPTICAL INTERFERENCE PATTERNS RECORDED BY CONTACT PRINTERS

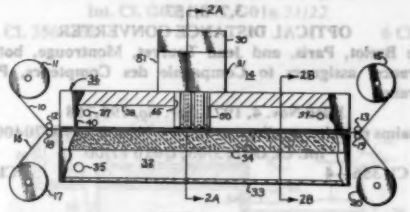
Minard A. Leavitt, Sepulveda, Calif., assignor to Cutter-Hammer, Inc., Milwaukee, Wis.

Filed Aug. 7, 1972, Ser. No. 278,634

Int. Cl. G03b *27/20*

U.S. Cl. 355—91 **24 Claims**

Optical interference patterns between adjacent surfaces of a flexible photographic transparency and an unexposed film is reduced by applying to the transparency a time variable, preferably directionioscillating force to vary the separation and/or angle between irregular areas of the adjacent surfaces. In a continuous contact printer where a length of transparency and a length of unexposed film are transported past a light source, a spatially variable force field is established along the length of the transparency by inducing flow of oppositely



directed gas streams. A first plurality of transverse grooves formed in a block overlying the non-adjacent surface of the transparency are connected to a source of fluid under pressure. A second plurality of transverse grooves formed in the block between respective ones of the first plurality of grooves are connected to a fluid sink at lower pressure. Fluid from each one of the first plurality of grooves flows to the adjacent ones of the second plurality of grooves.

3,778,156

HEATED SAMPLE CELL

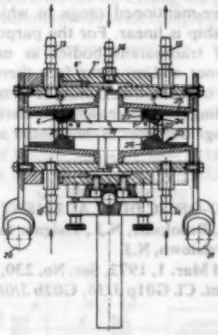
Helga Schmedes; Paul Hansen, both of Uberlingen, and Bernhard Welz, Merrsburg, all of Germany, assignors to Bodenseewerk Perkin-Elmer Co., GmbH, Uberlingen/Bodensee, Germany

Filed Sept. 28, 1972, Ser. No. 292,891

Claims priority, application Germany, Sept. 30, 1971, P 21 48 743.2

Int. Cl. G01j *3/30*

U.S. Cl. 356—244 **7 Claims**



A known type of heated sample cell assembly for atomic absorption spectroscopy includes an open-ended graphite sample tube having a central hole for initially introducing the sample into the tube and for allowing an inert protective gas to circulate from the otherwise closed surrounding housing into the tube to protect the interior surfaces from oxidization when the device is heated, as by large electrical currents supplied from electrodes in contact with both ends of the graphite tube. A known improvement includes the addition of holes near the ends of the graphite tube to reduce the speed at which a given total protective gas flow causes the sample to be expelled from the open end of the tube, thereby increasing useful measuring time. The present change includes providing bores through

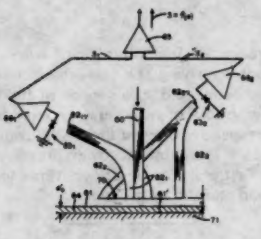
the electrodes so that the inert protective gas flows into the area immediately adjacent the open ends of the graphite sample tube. This technique of supplying additional protective gas tends to exclude air from reaching any part of the graphite tube, without causing eddy currents at the tube or complicating manufacturing of the tube by requiring carefully made additional holes in the graphite tube.

3,778,157

OPTICAL DISTANCE CONVERTER

Rene Brelot, Paris, and Jean Tourret, Montrouge, both of France, assignors to Compagnie des Compteurs, Paris, France

Filed Nov. 4, 1971, Ser. No. 195,768
Claims priority, application France, Nov. 6, 1970, 7040004
Int. Cl. G01c *3/08*; G01b *11/00*
U.S. Cl. 356—4 **7 Claims**



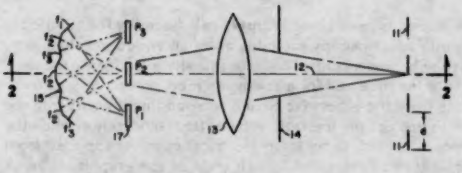
According to an illustrative embodiment an apparatus is provided for producing signals varying as a function of the distance of a surface relative to a reference face, comprising a fiber optic bundle for transmitting light to an emitting end thereof to illuminate a light reflecting surface. A fiber optic receiver bundle having at least one receiving end for picking up light reflected by the surface is provided for transmitting a flux of reflected light to produce a signal related to this relative distance by a linear relationship over a certain range of variation of such distance. The receiving end is transversely separated from the emitting end by an amount selected in accordance with a desired predetermined distance about which extends the above-mentioned range in which the signal to distance relationship is linear. For the purpose of measuring the thickness of transparent bodies as measured by the distance of an inner and an outer face thereof opposite the emitting end, the converter has at least two receiving ends arranged for providing respective signals linearly related respectively to the average distances of these inner and outer faces.

3,778,158

ELECTRO-OPTIC DISPLACEMENT DEVICE

Kent E. Erickson, Brookside, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed Mar. 1, 1972, Ser. No. 230,758
Int. Cl. G01p *3/36*; G02b *5/08*
U.S. Cl. 356—28 **1 Claim**



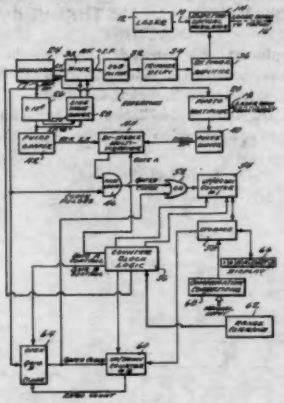
A device for determining and measuring the direction and extent of displacement of a regularly divided linear or circular scale comprises means for illuminating the scale over a plurality of divisions and detector means for imaging the illuminated portion of the scale upon an image divider which directs corresponding portions of the scale image to different ones of a plurality of photo-electric cells. The light thus incident upon the various photocells represents an average over a number of scale rulings and regularly varies with displacement in phase-displaced relationship among the photocells to provide a plurality of signals which can be employed in a directional electronic counting device.

3,778,159

DISTANCE MEASURING APPARATUS AND METHOD UTILIZING PHASE COMPARISON OF MODULATED LIGHT BEAMS

Robin H. Hines; William L. Hollinshead, and Thomas O. Bolden, all of Tullahoma, Tenn., assignors to Laser Systems & Electronics, Inc., Tullahoma, Tenn.

Continuation of Ser. No. 18,101, March 10, 1970, abandoned.
This application Mar. 30, 1972, Ser. No. 239,456
Int. Cl. 343 *12*; G01c *3/08*
U.S. Cl. 356—5 **9 Claims**

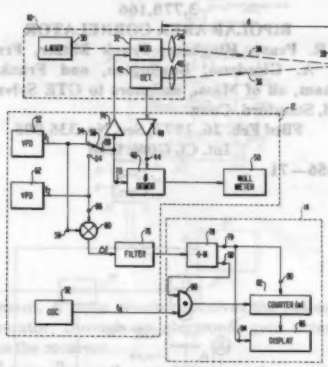


Apparatus and method for accurately measuring and digitally displaying the distance between remotely separated points involves modulating a light beam at a known radio frequency, transmitting the light beam from one of the points to reflect from the remote point and return to the transmitting point, digitally measuring the phase difference between the transmitted and returned beams, and determining from such phase difference the distance between the points. The light beam is modulated in sequence with a plurality of RF signals of different frequency in order to resolve ambiguities associated with phase comparison distance measuring techniques, the primary one of such modulating signals being obtained by mixing a reference radio frequency (RF) signal with a reference intermediate frequency (IF) signal derived by division of that reference RF signal, thus retaining a fixed frequency ratio with the reference RF signal. The return RF signal is also mixed with the reference RF signal to derive a second IF signal for comparison with the reference IF signal in a digital phase comparator which utilizes as the clock signal the reference RF signal. This method of deriving from a single oscillator source the various comparative signals greatly increases the tolerances of the system and reduces the need for expensive oscillators of extreme stability. The remaining modulating signals are likewise derived by mixing various RF signals with the reference IF signal, yet all modulating signals are maintained within a narrow frequency band, thus greatly reducing compensation requirements while improving accuracy, by utilizing as the additional RF signals those having frequency differences with the reference RF signal corresponding to half-wavelengths which are related to the half-wavelength of the primary beam-modulating RF signal by different powers of 10.

3,778,160
ELECTRONIC DISTANCE MEASURING DEVICE AND METHOD

John R. Wolcott, Orlando, Fla., assignor to Martin Marietta Corporation, New York, N.Y.

Filed Dec. 18, 1970, Ser. No. 99,560
Int. Cl. G01c 3/08
U.S. Cl. 356—5 16 Claims

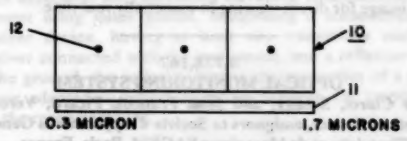


An electronic distance measuring device and method for determining the distance between two locations utilizing light or other electromagnetic wave energy. The wave energy is transmitted from one location to the other and is reflected back toward the transmitting location. The energy is detected and compared in phase with the transmitted energy, and the phase relationship between the transmitted and detected energy is varied until a predetermined phase relationship exists. The frequency of the transmitted wave energy is then varied until a predetermined phase relationship exists at a different frequency. The difference frequency may then be utilized to provide a direct digital display of distance between the predetermined locations.

3,778,161
EXTENDED-RANGE SPECTROSCOPE FOR INTENSE RADIATION SOURCES

Peter D. Poulsen, San Diego, Calif., assignor to General Dynamics Corporation, San Diego, Calif.

Filed Oct. 12, 1971, Ser. No. 188,270
Int. Cl. G01j 3/00
U.S. Cl. 356—51 22 Claims

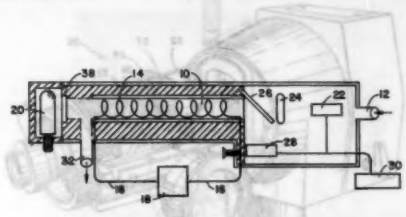


An improved spectroscope for securing simultaneous data regarding both spatial and spectral information from intense sources of radiation. A dual-mode optical system is utilized wherein spatial information is directed to three adjacent screens for the near ultraviolet, visible, and near infrared, respectively, and spectral information is directed to an elongated spectra screen located directly below the three spatial screens. This dual-mode function is performed through the use of fluorescent material technology which replaces the more conventional and complex image tube and detector array technology, thereby resulting in a truly portable spectroscope which is light weight, compact, low cost, requires little maintenance, and has very low power requirements.

3,778,162
APPARATUS FOR THE COLLECTION AND MEASUREMENT OF THE AMOUNT OF MERCURY VAPORS PRESENT IN A VOLUME OF AIR OR OTHER GASES

Preston L. Gant; Bill G. Motes, and Jerry T. Aylor, all of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Mar. 24, 1972, Ser. No. 237,840
Int. Cl. G01j 5/56; G01n 21/22
U.S. Cl. 356—51 6 Claims

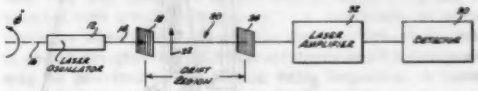


Apparatus for the collection and measurement of the amount of mercury vapors present in a volume of air or other gases. The apparatus includes a hollow chamber having a noble metal absorbent mounted therein for the absorption of mercury vapor present in gases passed therethrough, a power source connected to the absorbent for heating thereof, a light source mounted at a first end of the chamber, a first photo cell at a second end of the chamber positioned to receive a beam of light emanating from the lamp passing through the chamber, a mercury vapor reservoir adjacent the first photo cell and positioned in order that the beam of light emanating from the lamp passes through the reservoir prior to receipt thereof by the first photo cell, a second photo cell at a second end of the chamber positioned to receive a beam of light emanating from the lamp passing through the chamber without passing through the mercury vapor reservoir, a means for measuring the absorbence of the first and second photo cells and calculating the differential when the means for heating is activated, and a means for exiting the gases after the activation and measurement has been completed.

3,778,163
ROTATION-RATE MEASURING APPARATUS

Robert L. Forward, Oxnard, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 555,018, June 3, 1966, abandoned.
Filed Apr. 30, 1969, Ser. No. 832,537
Int. Cl. G03b 27/04
U.S. Cl. 356—114 9 Claims

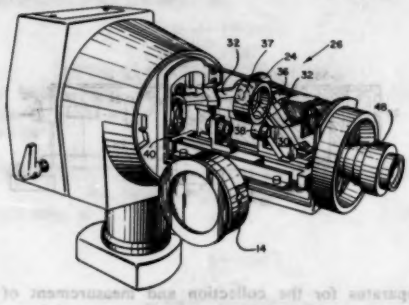


This invention is a gyro-type apparatus for sensing the rate of its rotation about a predetermined axis. In one embodiment, a light beam from an appropriate source is propagated through a drift region generally defined by two spaced optical polarizers having individual directions of polarization at a predetermined fixed angular relationship. Light energy passing through the far end of the drift region is detected to indicate the amount of change and direction of beam polarization that has taken place in the drift region due to the rotation of the apparatus.

3,778,164
OPHTHALMOMETER HAVING ALTERNATIVE VIEWING MEASURING SYSTEMS AND INCLUDING IMPROVED CONTACT LENS HOLDING MEANS

Terence Walker, East Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Nov. 29, 1972, Ser. No. 310,292
Int. Cl. G01b 9/00, 21/04; A61b 3/10
U.S. Cl. 356—124 **12 Claims**

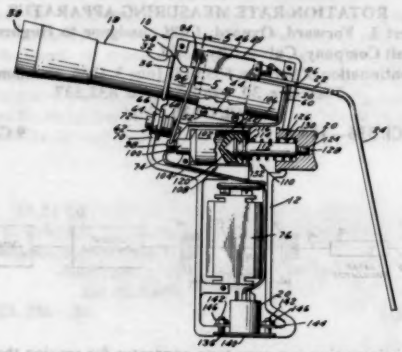


Ophthalmometer including a measuring circuit for measurement of the curvature of the cornea and contact lens curvatures with a built-in viewing circuit which is activated by the movement of a lever to allow visible inspection of the cornea and contact lenses. An interference ultraviolet filter in communication with a single light source permits the cornea to be viewed under ultraviolet light as well as ordinary visible light.

3,778,165
PORTABLE FLOW-THROUGH DISPENSING REFRACTOMETER APPARATUS

John J. Grubb, La Habra, and Keichi Tomei, Monterey Park, both of Calif., assignors to Hamilton Company, Whittier, Calif.

Filed May 24, 1971, Ser. No. 146,283
Int. Cl. G01n 21/46
U.S. Cl. 356—128 **9 Claims**

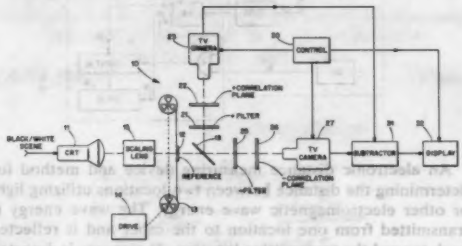


A portable flow-through dispensing refractometer apparatus having a specimen plate and a meter with refractive index scales. There is a flow-through cell, which includes the specimen plate, and a finger operated pump for precise volume pick up of specimens, or samples, for introduction into the flow-through cell. A built-in light source provides for illumination of the specimen plate to improve visual reading of the scales of the meter. There is a rechargeable battery in the handle of the apparatus and a stand to which the refractometer apparatus is removably attached and supported; a rectifier in the stand is adapted to be connected to a source of electrical energy and supplies electric current to the battery for charging it when the refractometer apparatus is attached to the stand.

3,778,166
BIPOLAR AREA CORRELATOR

Richard R. Pease, Hingham; Frank Blitzer, Framingham; Arthur A. Giordano, Burlington, and Frank L. Less, Wrentham, all of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Feb. 26, 1973, Ser. No. 336,005
Int. Cl. G06k 9/08
U.S. Cl. 356—71 **23 Claims**



An optical area correlator employing a cathode ray tube for producing an image of a scene illuminated with incoherent light. Light rays from the image of the scene pass through transparent regions of a bipolar reference representing a feature being sought in the scene. By any of various means the transparent regions designating positive values of the reference are distinguished from the transparent regions designating negative values. The positive and negative components of light passing through the positive and negative transparent regions of the reference are separated so as to form separate + and − correlation images, respectively. The two correlation images are separately viewed by a TV camera or cameras and the resulting electrical signals are algebraically added by a linear subtractor. The output of the subtractor is the correlation output which is a measure of the degree of correlation of the reference with the scene. This output may be applied to a TV monitor which produces a resultant correlation image for direct viewing in essentially real time.

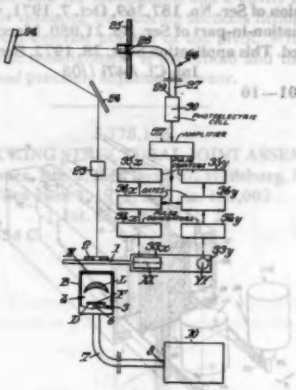
3,778,167
OPTICAL MONITORING SYSTEM

Rene Claret, Sceaux, and Jean Francois Picard, Versailles, both of France, assignors to Societe d'Applications Generales d'Electricite et de Mecanique SAGEM, Paris, France

Filed Oct. 1, 1971, Ser. No. 185,776
Claims priority, application France, Dec. 17, 1970, 7045542
Int. Cl. G01b 11/00
U.S. Cl. 356—167 **12 Claims**

A support is arranged to bear the part to be measured or checked and an optical device illuminates the part by diascopy or by episcopy by a parallel beam of light. The light source is the output end of a light guide placed at the focus of the optical device. At the distant input end is a light generator. A photoelectric receiver collects the beam of light emerging from the optical device after it has illuminated the part by diascopy or by episcopy. Relative displacement between the support and the optical device-receiver device assembly, is effected in a transverse direction with respect to the light beam.

A pulse generator is actuated by this movement and delivers a number of electrical pulses proportional to the amplitude of



the movement. A pulse counter receives the pulses from the pulse generator, through an electronic gate actuated by a signal from the receiver.

3,778,168

APPARATUS FOR THE CONTROL OF TRAVELING CONSTRUCTIONAL IMPLEMENTS

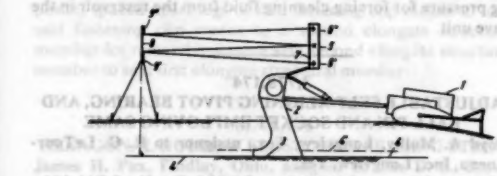
Kurt Willner, Kurt Willner Legederstrasse 12, Munster, Germany

Filed July 22, 1971, Ser. No. 165,304

Claims priority, application Germany, July 27, 1970, P 20 37 130.6

Int. Cl. G01b 11/26

U.S. Cl. 356—152 **11 Claims**



An apparatus for controlling travelling constructional implement using guide planes, comprising a transmitter and receiver device, having at least one transmitter and one receiver connected with the implement, and a reflector fixed to the ground, the reflector having the properties of a plane mirror adapted to reflect radiation between the transmitter and the receiver means.

3,778,169

OPTICAL ALIGNMENT TARGET APPARATUS

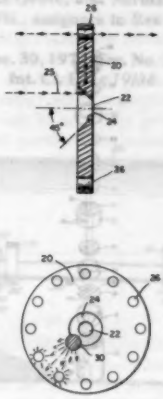
Larry D. Adams, Collingswood, N.J., assignor to Metrologic Instruments Inc., Bellmawr, N.J.

Filed Feb. 26, 1973, Ser. No. 335,500

Int. Cl. G02b 5/16; G01d 7/06; B01b 11/26

U.S. Cl. 356—172 **13 Claims**

An alignment target for use with a collimated light source, comprising a disc of translucent material with a 45° annular surface around the center thereof, which surface receives light directed perpendicular to the disc and directs it radially outward by scattering, refraction or reflection toward passive light indicators spaced circumferentially around the outer portion of the disc. In use of the target, a light source such as a laser is directed upon the disc, and any misalignment of the laser results in a light indication from specific ones of the pas-



sive light indicators corresponding to the angle of misalignment, enabling the operator to realign the laser until it is centered within the counterbore of the target.

3,778,170

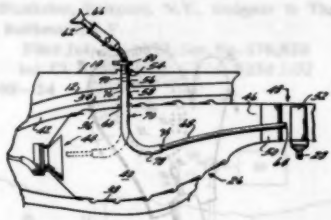
BORESCOPE GUIDE TUBE

Charles B. Howell, Cincinnati, and Richard E. Drew, Loveland, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 2, 1972, Ser. No. 303,198

Int. Cl. G01n 21/16

U.S. Cl. 356—241 **10 Claims**



An inspection assembly for inspecting the interior of a gas turbine engine, or similar complicated structure, is shown to include a guide tube which is insertable through a number of aligned access ports in the engine. The guide tube is designed to direct the distal tip of a suitable inspection device, such as a fiber optic borescope, to appropriate internal areas for inspection. The tube includes a curved section, which is formed of material with a built-in "memory," i.e., will retain its initial curvature when in its free state, but also is sufficiently flexible to permit straightening such that extremely small access ports may be provided in the device being inspected. A novel method of using such apparatus is also disclosed.

3,778,171

SAMPLE CELL FOR ULTRACENTRIFUGE UTILIZING MULTIPLE-BEAM INTERFERENCE OPTICS

Charles Henry Chervenka, Sunnyvale, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Nov. 9, 1972, Ser. No. 304,909

Int. Cl. G01n 1/10, 21/24

U.S. Cl. 356—246 **5 Claims**

This invention provides a sample cell for an analytical ultracentrifuge which allows recording of solution-solvent

fringes and solvent-solvent fringes simultaneously from the cell under exactly the same experimental conditions. A unique feature of the cell is that it permits the passage of three or four

beams of light through it, rather than the usual two. The multiple beams of light form two sets of interference patterns, from which one can correct for the contribution of cell windows to refractive index changes.

3,778,172

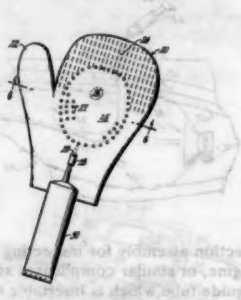
BODY SCRUBBING ARTICLES

Darrell P. Myren, 4425 Pacific Coast Hwy., Torrance, Calif.

Filed Mar. 10, 1969, Ser. No. 805,509

Int. Cl. A46b *5/04*

U.S. Cl. 401—7 **7 Claims**



Somewhat pressure-deformable articles such as scrubbing pads or mittens have a flexible surface area of resiliently upstanding (nylon) loops, which are used in conjuction with detergent material to scrub a person's skin without abrading it, thus to remove such difficultly cleanable substances as printer's ink, mechanic's grime and grease, etc. Such scrubbing article, being water-repellent is itself cleaned simply by a flow of hot water. The mitten has a valved liquid-detergent pouch in its palm from which portions can be expelled simply by the wearer pressing his hand against the skin surface being cleaned; the palmar finger area outward from the pouch is covered by the upstanding loops for scrubbing. The alternate scrubbing pad is formed with separate portions of (a) readily-compressible backing material and (b) relatively rigid backing material each of which is covered by the napped sheet material; the former portion enables easy conformance with contacted skin curvature, and the latter provides a firm area for greater frictional application in scrubbing.

3,778,173

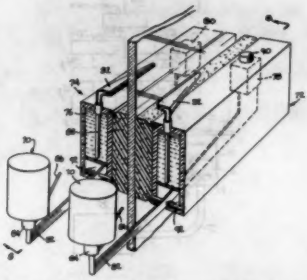
WINDOW CLEANING APPARATUS

Joseph P. De Carlo, 200 Harding Ct., Centerport, N.Y.

Division of Ser. No. 187,369, Oct. 7, 1971, which is a continuation-in-part of Ser. No. 21,050, March 19, 1970, abandoned. This application Sept. 28, 1972, Ser. No. 293,059

Int. Cl. A47l *1/08*

U.S. Cl. 401—10 **4 Claims**



Apparatus for simultaneously cleaning both sides of a window comprises master and slave magnetic cleaning units. When the cleaning units are aligned on opposite sides of the window, magnetic attraction causes the slave cleaning unit to press against and to slide on the outside of the window in response to corresponding movement of the master cleaning unit on the inside of the window. Self-contained cleaning fluid reservoirs in alternative embodiments of the cleaning units controllably dispense cleaning fluid onto the window surfaces in response either to gravity forces, controlled by orientation of the master unit with respect to the vertical, or to magnetic biasing means actuated by a control means on the master unit. In the present invention, magnetic biasing means acts indirectly to control energy storage means, such as a pressurized container in the slave unit, which in turn generates the pumping pressure for forcing cleaning fluid from the reservoir in the slave unit.

3,778,174

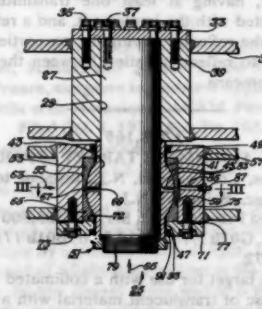
ADJUSTABLE SELF-ALIGNING PIVOT BEARING, AND BALL PIN AND SOCKET EMPLOYING SAME

Lloyd A. Molby, Longview, Tex., assignor to R. G. LeTourneau, Inc., Longview, Tex.

Division of Ser. No. 94,684, Dec. 3, 1970, Pat. No. 3,711,121. This application Aug. 10, 1972, Ser. No. 279,497

Int. Cl. B62d *53/02*

U.S. Cl. 287—96 **10 Claims**



A pin and socket for use in a pivot connection characterized by a shaft carrying a pivot having a spherically shaped exterior portion; a bearing having at least two sections covering substantially the entire spherical exterior portion for sustaining

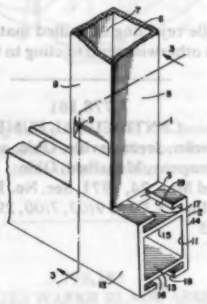
maximum radial and thrust forces, but having a small clearance adjacent the equator of the spherical portion for wear adjustment and for lubrication; and a cavity and thrust plate means for retaining the bearing sections fittingly engaging the spherical exterior portion of the pivot. With the disclosed structure, misalignment is prevented and the pin and socket easily and precisely adjusted for wear.

3,778,175

SNAP LOCKING STRUCTURAL JOINT ASSEMBLY

Ernest C. Zimmer, Rte. 2, P.O. Box 307, Wellsburg, N.Y.

Filed June 4, 1971, Ser. No. 150,002
Int. Cl. F16b *7/22*
U.S. Cl. 287—54 C **17 Claims**



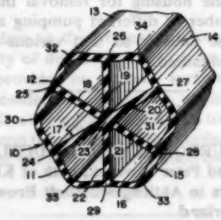
A snap-locking structural joint assembly and method of assembling same comprising an elongate structural connecting member having longitudinally extending channel means in at least one side thereof and a fastening clip means having flange means thereon adapted to be received in said channel means to secure said fastening clip to said elongate structural member, and locking means operatively associated with opposite, spaced apart legs of said fastening clip means to lock said fastening clip means to a second elongate structural member for releasably joining said second elongate structural member to said first elongate structural member.

3,778,176

HEXAGONAL HOLLOW ELASTOMER SEALING STRIPS

James H. Pax, Findlay, Ohio, assignor to The D. S. Brown Company, North Baltimore, Ohio

Filed July 22, 1971, Ser. No. 165,004
Int. Cl. E01c *11/10*
U.S. Cl. 404—65 **4 Claims**



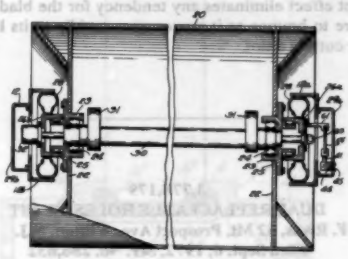
Elastomer seals embodying hexagonal tube with the internal elongated elastomer web structures characterized by elongated, inner webs joined together at their inner edges in the longitudinal axis of said tube and respectively intersecting the approximate mid-portion of the sides of said tube; useful for sealing concrete joints and other sealing applications, including automotive applications.

3,778,177

VIBRATION METER SYSTEM FOR VIBRATORY COMPACTION MACHINES

Edwin J. Haker, Elm Grove, and Norman L. Peterson, Wauwatosa, both of Wis., assignors to Rex Chainbelt Inc., Milwaukee, Wis.

Filed Dec. 30, 1971, Ser. No. 214,290
Int. Cl. E01c *19/38*
U.S. Cl. 404—117 **8 Claims**



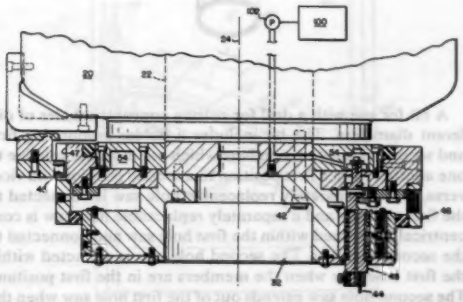
A soil and road-grade compaction machine includes a heavy rigid frame, a roller having a power driven eccentric weight rotating about the roller axis, and cushion means which allows the roller to vibrate with only nominal movement of the frame. The vertical component of the movement of the roller relative to the frame or "bounce" of the roller operates an electric current generator having its output inductively attenuated and then rectified and measured by a meter which indicates any increase or decrease in the bounce of the roller in relative terms.

3,778,178

APPARATUS FOR CONTROLLING BLADE POSITIONING IN A CUTTER HEAD ASSEMBLY

Ernst J. Hunkeler, Fairport, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed July 31, 1972, Ser. No. 276,620
Int. Cl. B23b *41/12, 47/18;* **B23d** *5/02*
U.S. Cl. 408—54 **12 Claims**



Apparatus for controlling operative positioning of individual blades in a cutter head assembly of a type which may be used for cutting "blind" arcuate slots in a workpiece, such as the seal slots required for rotors of rotary, combustion engines. A plurality of blade-holding structures, and their associated blades, is positioned about a circumference of the cutter head. Each blade-holding structure is mounted so as to be independently movable axially relative to the cutter head to thereby provide for successive and progressive engagement and disengagement of individual blades with the workpiece as the cutter head rotates during a cutting operation. A portion of each blade-holding means is carried within a fluid chamber

which communicates with a fluid pressure system so as to normally urge each blade-holding structure toward its cutting position. In addition, a stop limit means is contained in the fluid chamber to limit the movement of each blade-holding means in a cutting direction. Each stop limit means is arranged to create a dash pot effect with fluid contained in the chamber during final increments of movement of the blade-holding means to its extended limit position. This arrangement reduces shock and vibration in the cutter head assembly and minimizes noise during operation of the assembly. Also, the dash pot effect eliminates any tendency for the blade-holding structure to bounce as it moves very rapidly to its limit position for cutting a slot.

3,778,179

DUAL REPLACEABLE HOLESAW BIT

Dayton F. Rivas, 62 Mt. Prospect Ave., Clifton, N.J.

Filed Sept. 6, 1972, Ser. No. 286,632

Int. Cl. B23b *51/04*

U.S. Cl. 408—206 **15 Claims**

A bit for use with a drill for cutting concentric holes of different diameters. The bit includes a holder comprising first and second elongated members which are movable relative to one another from a first position to a second position and vice-versa. A first separately replaceable hole saw is connected to the first member and a separately replaceable hole saw is concentrically disposed within the first hole saw and connected to the second member. The second hole saw is retracted within the first hole saw when the members are in the first position. The second hole saw extends out of the first hole saw when the members are in the second position.

3,778,180

CIRCUIT BOARD DRILL AND METHOD

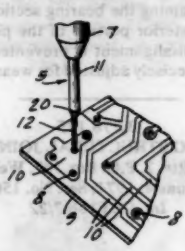
Charles T. Ostrom, Gardena, Calif., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Mar. 10, 1972, Ser. No. 233,563

Int. Cl. B23b *51/02*

U.S. Cl. 408—226 **3 Claims**

A circuit board drill of the straight shank shouldered type has the cutting edge flutes extended up through the shoulder between the shank and the smaller diameter fluted portion of



the drill to enable rejecting of drilled material shavings, such as copper which otherwise tend to cling to the shoulder.

3,778,181

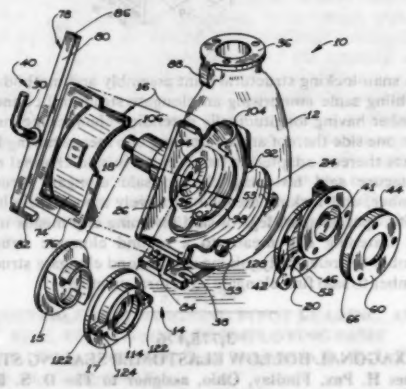
CENTRIFUGAL PUMP

Stanley B. McFarlin, Jeromesville, Ohio, assignor to The Gorman-Rupp Company, Mansfield, Ohio

Filed Mar. 24, 1971, Ser. No. 127,446

Int. Cl. F04d *9/02, 7/00, 29/40*

U.S. Cl. 415—53 **18 Claims**



A centrifugal pump is disclosed which comprises a pump housing containing a centrifugal pumping assembly. The housing has an access opening at one side of the pumping assembly and the parts of the pumping assembly are detachably supported within the housing for removal through the access opening. A number of different pumping assemblies can be supported in the housing so that various pumping characteristics can be obtained.

3,778,182

TURBOMACHINE STRUCTURE

Alfred Hohn, and Peter Novacek, both of Kirchdorf, Switzerland, assignors to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Feb. 8, 1972, Ser. No. 224,573

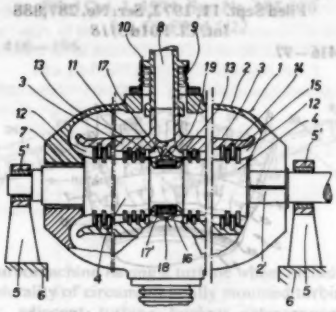
Claims priority, application Switzerland, Feb. 19, 1971, 2438/71

Int. Cl. F01d *3/02, 11/10*

U.S. Cl. 415—101 **4 Claims**

A turbomachine enclosed within a casing and provided with pedestal type plain bearings located outside the casing at opposite ends of the latter for supporting the rotor shaft. In addition to the externally located pedestal bearings, a flexible, cen-

tering, auxiliary bearing is mounted on the guide blade carrier within the casing to provide additional support for the rotor,



this auxiliary bearing being located at the point of maximum amplitude of the fundamental oscillation frequency of the rotor so as to reduce shaft vibration disturbances.

3,778,183

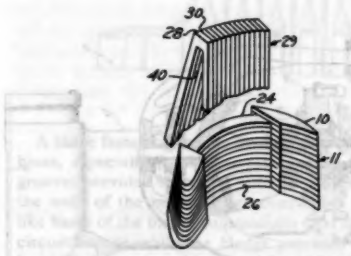
COOLING PASSAGES WAFER BLADE ASSEMBLIES FOR TURBINE ENGINES, COMPRESSORS AND THE LIKE

Werner P. Luscher, El Dorado Hills, and Leonard Schoenman, Citrus Heights, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed Apr. 22, 1968, Ser. No. 723,203

Int. Cl. F01d *5/14*

U.S. Cl. 415—115 **2 Claims**



A blade according to the present disclosure comprises a stack of a plurality of discrete wafers. A control passage of flow passages is provided on a planar surface of each wafer and means is provided for delivering coolant to the flow passages. The wafers are sufficiently thin as to permit thermal equalibrium between the wafers and the coolant flowing in the passages so that the blades are transpiration cooled.

3,778,184

VANE DAMPING

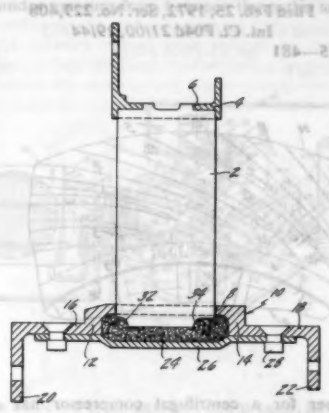
Donald H. Wood, Glastonbury, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed June 22, 1972, Ser. No. 265,413

Int. Cl. F01d *1/08, 1/02, 9/00*

U.S. Cl. 415—174 **4 Claims**

Damping of compressor or turbine vanes in the supporting shroud is accomplished by surrounding one end of the vane with a damping material of the steel wool or felt metal type



held in contact with the shroud in which the vane is loosely supported.

3,778,185

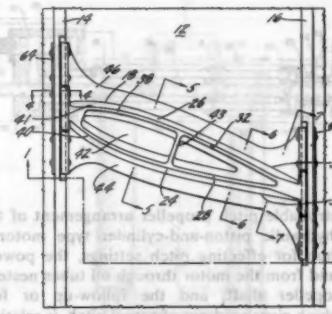
COMPOSITE STRUT JOINT CONSTRUCTION

James S. Plowman, Longmeadow, Mass., and Ivar G. Fowkes, East Hartford, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Aug. 28, 1972, Ser. No. 284,388

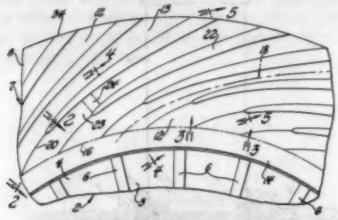
Int. Cl. F01d *9/02*; F04d *29/44*

U.S. Cl. 415—217 **9 Claims**



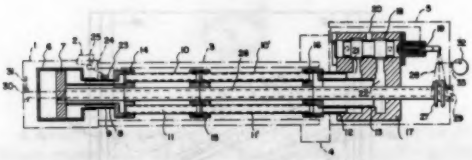
A composite strut includes an end extending radially through an opening in the wall of a cylindrical duct. The end of the strut has tapering surfaces forming a wedge-shaped cavity, and a wedge having the shape of the cavity is bonded to the surfaces of the cavity. The end of the strut also includes outwardly facing surfaces substantially parallel to and spaced from the tapered surfaces of the cavity. Stiffeners having surfaces in face-to-face abutting relationship to the outwardly facing surfaces are fixed to the duct and prevent the strut from being pulled radially through the duct opening. The stiffeners also absorb torsional and bending loads from the strut and transfer those loads into the duct.

3,778,186
RADIAL DIFFUSER
Phiroze Bandukwalla, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Feb. 25, 1972, Ser. No. 229,408
Int. Cl. F04d *21/00, 29/44*
U.S. Cl. 415—481 2 Claims



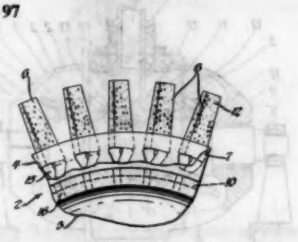
A diffuser for a centrifugal compressor has diffusing passages of circular or oval cross section which converge toward a throat and then diverge. The passages are of generally spiral curvature, at least in the converging portion. The entrances of the diffuser passages merge to define leading edges of generally elliptical shape between the passages.

3,778,187
CONTROLLABLE PITCH PROPELLERS FOR MARINE VESSELS
Peder K. Wennberg, Port Washington, N.Y., assignor to Propulsion Systems, Inc., Port Washington, N.Y.
Filed Apr. 13, 1971, Ser. No. 133,682
Int. Cl. B63h *3/08*
U.S. Cl. 416—95 22 Claims



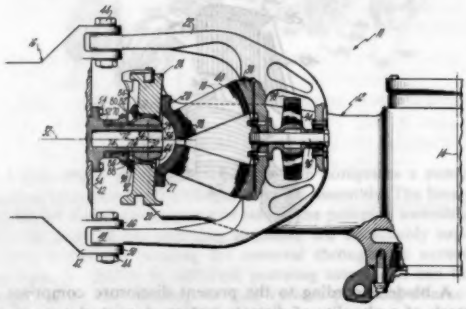
In a controllable pitch propeller arrangement of the type having a hydraulic piston-and-cylinder type motor in the propeller hub for effecting pitch settings, the power oil is passed to and from the motor through oil tubes nested in the hollow propeller shaft, and the follow-up or feedback member, which gives read-out of actual pitch, is relatively isolated from the temperature effects of the power oil, preferably by arranging the follow-up or feedback member as the central member of a nested arrangement in which the power oil tubes are radially spaced from the feedback member about the circumference of the nested assembly. Preferably the feedback member and the oil tubes are arranged as a unitary bundle, made up of several sections, and the oil tubes of each section are provided with sliding seals at the section coupling, whereby thermal expansion and contraction of the oil tubes is absorbed by the sliding seals in each section and will not affect the overall length of the bundle or the feedback member, thus preventing or minimizing erroneous pitch feedback signals. The follow-up member preferably is tubular, and an air tube passes therethrough to feed air to the propeller blades.

3,778,188
COOLED TURBINE ROTOR AND ITS MANUFACTURE
Robert H. Aspinwall, Zionsville, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Sept. 11, 1972, Ser. No. 287,888
Int. Cl. F01d *5/18*
U.S. Cl. 416—97 3 Claims



An integral cast turbine rotor wheel includes a disk and porous blades extending from the disk and into the rim of the disk, the disk defining cooling air entrance ports communicating with the porous blades so that cooling air may be circulated through them. The method of manufacture of the wheel includes providing cores defining air ports and blades, the blade portion of each core being porous, placing the cores in a mold shaped to conform to the wheel and pouring metal to define the cast body. The cores are then removed and any necessary machining of the wheel is performed.

3,778,189
ELASTOMERIC HELICOPTER ROTOR HEAD WITH DYNAMIC AND STATIC BLADE CONING AND DROOP STOPS
Donald L. Ferris, Newtown, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Sept. 5, 1972, Ser. No. 286,509
Int. Cl. B64c *27/38*
U.S. Cl. 416—140 22 Claims



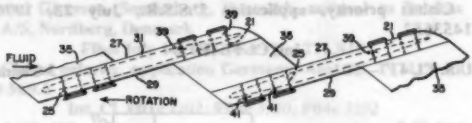
An elastomeric helicopter rotor having a blade mounted for universal motion about the intersection of the blade pitch change, flapping and lead-lag axes and including blade coning and droop stops, including a ring member rotatably mounted about the pitch change axis on the blade and coning and droop stops constituting segments of circular members whose centers lie on the blade lead-lag axes and with the ring member and coning stop and droop stop members presenting mating surfaces to one another so that as the blade moves in lead-lag motion while the blade ring member is in line or surface mating contact with either the coning stop surface or the static or dynamic droop stop surfaces, a relative rotation will be established therebetween for full support of the blade throughout the lead-lag motion, without affecting blade pitch angle or flapping angle, without preventing independent blade pitch change, and without scuffing of parts.

3,778,190

BUCKET COVER ATTACHMENT

Joseph H. Ouellette, Albany, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 1, 1971, Ser. No. 185,670
Int. Cl. F01d 5/22
U.S. Cl. 416—196 3 Claims



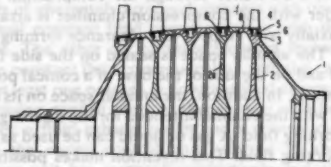
In a turbomachine having a turbine wheel including a rotor with a plurality of circumferentially mounted turbine buckets thereon; adjacent turbine buckets interconnected by a diagonal cover piece; a bucket cover attachment device which permits limited articulation of the buckets relative to one another as the turbine buckets twist and untwist.

3,778,191

BLADE MOUNTING

Heinz Brockmann, Ober-Erlenbach/uber Bad Homberg, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Jan. 21, 1971, Ser. No. 108,350
Claims priority, application Germany, Jan. 21, 1970, P 20 02 469.5
Int. Cl. F01d 5/32
U.S. Cl. 416—215 33 Claims



A blade fastening for the blades of compressors and/or turbines, especially for blades retained in dove-tail tangential grooves provided along the outer diameter of the rotor disks; the webs of the tangential grooves cover the hammer-head-like bases of the blades substantially over the entire rotor disk circumference while the blades provided with the hammer-head-like bases are adapted to be inserted by rotation into the tangential groove provided with small apertures; in order to fix the blades in a predetermined position relative to the rotor disk diameter, filler, clamping and locking elements are provided.

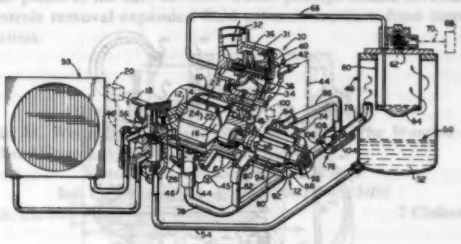
3,778,192

METHOD AND APPARATUS FOR UNLOADING A ROTARY COMPRESSOR

Terrence Caffrey, Kent, Ohio, assignor to The Davey Compressor, Kent, Ohio

Filed Apr. 7, 1972, Ser. No. 242,166
Int. Cl. F04b 23/04
U.S. Cl. 417—286 12 Claims

A method and apparatus are disclosed for relieving the fluid pressure at the outlet of an air compressor when the latter pressure exceeds the pressure of air in a compression cell of the compressor arriving at the outlet. The air pressure at the outlet is relieved by blocking backflow of air under pressure at a point downstream from the outlet and transferring air under pressure at the outlet to a point downstream of the point of backflow blocking. Blocking is achieved by means of a fluid pressure responsive check valve in a flow path between the outlet and a point of use for the compressed air, and transfer of air under pressure from between the outlet and the check valve is achieved by an auxiliary compressor, having a smaller input capacity than the output of the main compressor. During operation of the main compressor to deliver its rated volume of air at its rated pressure the auxiliary compressor and check valve cooperate to deliver the compressor output toward the point of use.

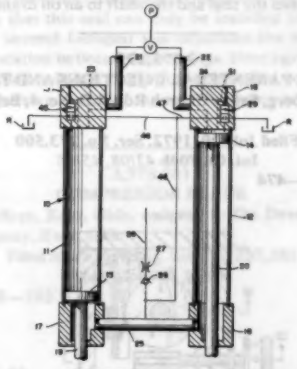


3,778,193

SLAVE SYSTEM FOR A PAIR OF HYDRAULIC CYLINDERS

Gerald H. Reinert, 6 Brightwood Rd., Cold Spring, Ky.

Filed Sept. 8, 1971, Ser. No. 178,762
Int. Cl. F04b 17/00
U.S. Cl. 417—342 3 Claims



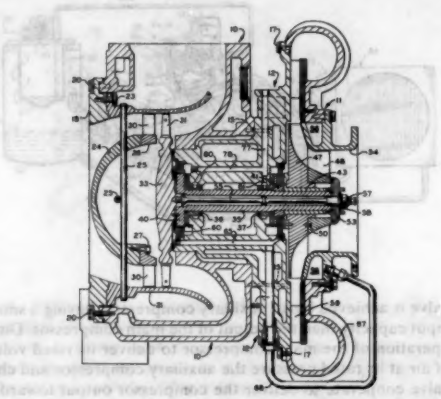
A slave system for a pair of hydraulic cylinders and pistons for retracting one piston while the other piston is extended is provided with valves for venting excess hydraulic fluid when each piston reaches its fully retracted position. The line for the make-up fluid for the slave system is connected to a spool valve in the retracting or rearward end of each cylinder, and when each piston is fully retracted it forces a spool valve open to vent excess make-up fluid and slave fluid. The spool valve is spring-biased to a closed position, and when the piston begins to extend the valve closes.

3,778,194

TURBOCHARGER STRUCTURE

Arthur J. Miller, Irwin, and Robert A. Miller, Jeannette, both of Pa., assignors to Carrier Corporation, Carrier Parkway, Syracuse, N.Y.

Filed Aug. 28, 1972, Ser. No. 284,181
Int. Cl. F04b *17/00*
U.S. Cl. 417—407 2 Claims



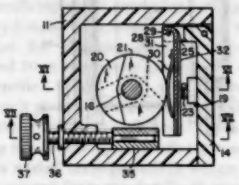
The turbine-impeller shaft is journaled in a pair of bearings mounted in the intermediate section of the turbocharger casing. An oil seal is mounted in that section intermediate the turbine disc and one of the shaft bearings and a second seal is mounted intermediate the impeller and the other bearing. The seals are formed with radially disposed passages communicating with the area between the seals and the shaft. An air passage extends from the output of the compressor section to the seal passages for the discharge of air between the seals and the shaft for cooling the same and the lubricating oil. An oil return baffle is disposed intermediate the turbine disc and the contiguous seal. The baffle extends radially inwardly between the seal and the disc in overlying relation to the seal and the end of the shaft. The baffle serves to redirect any oil leakage passing between the seal and the shaft to an oil drain cavity.

3,778,195

PUMP FOR PARENTERAL INJECTIONS AND THE LIKE

George Bamberg, Salem Church Rd., R.D. No. 4, Belle Vernon, Pa.

Filed July 20, 1972, Ser. No. 273,500
Int. Cl. F04b *43/08*, *45/06*
U.S. Cl. 417—474 4 Claims



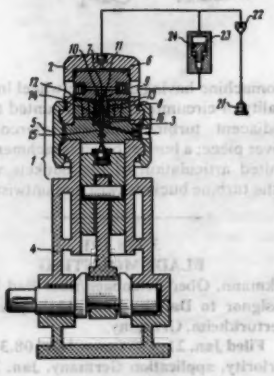
The pump for parenteral injections and the like operates by a peristaltic type action. the pump includes a shaft having a plurality of cams spaced therealong. The cams act on spring loaded members adjacent the cam which, in turn, sequentially squeeze a disposable, flexible tubing held by a support. An adjusting mechanism is also positioned adjacent the members so as to control the cross sectional area of the disposable, flexible tubing. The rate of flow is controlled by the adjusting mechanism.

3,778,196

HIGH-PRESSURE PLUNGER COMPRESSOR

Leonid Fedorovich Vereschagin, Kutuzovsky prospekt, 2/1, kv. 231; Jury Sergeevich Konyaev, ulitsa Fersmana, 11, kv. 26; Evgeny Valentinovich Polyakov, Belyaeyo-Bogorodskoe, 39, kv. 73, all of Moscow, and Ivan Efimovich Surkov, ulitsa Shkolnaya, 6, kv. 53, Moskovskaya Oblast, all of U.S.S.R.

Filed July 14, 1971, Ser. No. 162,424
Claims priority, application U.S.S.R., July 23, 1970, 1453652
Int. Cl. F04b *7/04*
U.S. Cl. 417—501 3 Claims



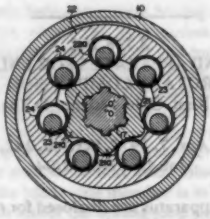
The present invention relates to devices designed for building up high pressures. A high-pressure plunger compressor comprises a cylinder with a compression chamber. Pressed to the cylinder is a piston with a discharge channel. A plunger is passed with a clearance through the compression chamber. The cylinder with the compression chamber is arranged in a clamp coaxially with respect to a clearance forming an annular space. The annular space is sealed on the side facing the piston end and on the side of the base of a conical portion of a sealing bushing. In addition, the annular space on its end communicates with the channel intended for the discharge of compressed working fluid. A gas or liquid can be used as the compressed working fluid. This invention makes possible an extended service life of the cylinder with the compression chamber.

3,778,197

FLUID PRESSURE DEVICE

Moriyuki Takagi, 31, Katayama, Niiza-shi, Japan

Filed May 18, 1972, Ser. No. 254,639
Claims priority, application Japan, May 22, 1971, 46/34873
Int. Cl. F04c *1/06*; F01c *1/02*
U.S. Cl. 418—61 4 Claims



A rotary motor includes a casing in which there is disposed a shaft mounted on an externally toothed gear. The shaft can rotate about its axis without orbital or planetating movement

by the aid of an outer cylinder and cams provided in the interspace between the gear and outer cylinder and contacting them when the pressure fluid is introduced in the interspace to move the cams, cylinder and gear.

3,778,198

MESHING ROTARY PISTON MACHINE WITH AN INTERNAL SHAFT

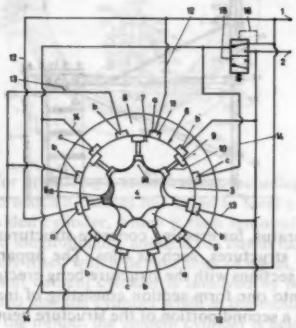
Svend Giversen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordberg, Denmark

Filed July 14, 1972, Ser. No. 271,810

Claims priority, application Germany, Aug. 13, 1971, P 21 40 569.6

Int. Cl. F01c *1/02*; F03c *3/00*; F04c *1/02*

U.S. Cl. 418—61 **8 Claims**



The invention relates to fluid pressure motors and pumps of the type having a gerotor displacement mechanism and an axial type of valve. The casing has inlet and outlet ports and a speed and load control port. The rotary valve has first and second sets of alternately arranged passages with one set having the usual constant fluid communication with the casing outlet port. The other set of valve passages includes some passages in constant fluid communication with the casing inlet port and at least one passage in constant fluid communication with the casing control port. A change over unit has a fluid supply inlet, a fluid exhaust outlet and a control outlet connected to the casing control port referred to above. The change over unit has means for selectively and alternately connecting the control port to the supply inlet and exhaust outlet thereof.

3,778,199

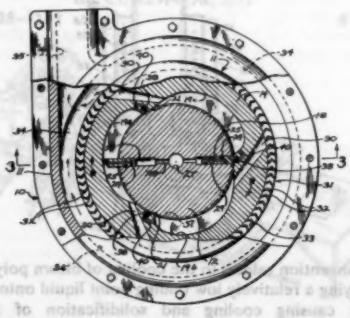
ROTARY ENGINE

George W. Meacham, 2021 Edgewater Dr., Clearwater, Fla.

Filed Mar. 24, 1972, Ser. No. 237,815

Int. Cl. F01c *19/00*

U.S. Cl. 418—104 **11 Claims**



Fluid-pressure operated rotary engine has annular rotor mounted to rotate in an annular chamber in fixed housing, rotor having plurality of peripherally spaced cavities defining cam surfaces between intermediate bearing lands for rotational engagement on cylindrical hub having peripherally spaced radial slots. Fluid-pressure medium efficiently and effectively fed through rotor to said radial slots urges slide plates radially outwardly for cam engagement with cam surfaces and lands with rotation of said rotor induced by predetermined proportion of fluid-pressure medium being by-passed through slide plates to the cam cavities. Outlet passage means in rotor controls removal expended fluid-pressure medium from cam cavities.

3,778,200

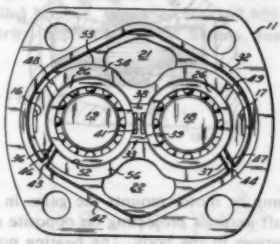
ROTARY FLUID PUMP OR MOTOR

Ellis M. Wellman, Chardon, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed Feb. 2, 1972, Ser. No. 222,909

Int. Cl. F01c *19/08*; F03c *3/00*; F04c *15/00*

U.S. Cl. 418—132 **7 Claims**



A gear pump is disclosed in which pressure plates engage and provide a dynamic seal with the ends of the gear elements. The side of each pressure plate remote from the gear is divided into two separate pressure balancing zones, one of which is maintained substantially at inlet pressure and the other at outlet pressure. A simplified seal assembly functions to seal the main housing and end caps and also to separate the two pressure zones. The main seal is ring-shaped and is formed with integral inwardly extending projections. The structure is arranged so that this seal can only be installed in the proper position. A second I-shaped seal separates the two pressure zones at a location between the bearings. Here again, such seal can be installed only in a single proper installed position. Both seals are pressure actuated to insure proper and complete sealing.

3,778,201

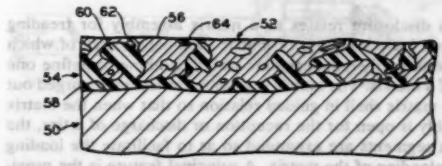
COMPRESSOR BLADE

Terence Caffrey, Kent, Ohio, assignor to The Davey Compressor Company, Kent, Ohio

Filed Mar. 23, 1972, Ser. No. 237,281

Int. Cl. F01c *21/00*

U.S. Cl. 418—152 **6 Claims**



An improved blade or vane structure is provided for a rotary, vane-type fluid compressor. The vane has a solid body of

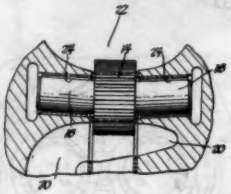
a metal having a low density and a high heat conducting capacity. The metal body is coated with an abrasion-resisting coating which has voids therein between the outer surface of the coating and the vane body. The voids are filled with plastic material to strengthen the coating against collapse in response to forces imposed on the vane during operation of the compressor. An outer coating of self-lubricating material may be bonded to the outer surface of the abrasion-resisting coating.

3,778,202

POWER TRANSMISSION

Anthony Lindsay, Troy; Ronald Lee Imperati, Livonia, and Philipp Becker, Rochester, all of Mich., assignors to Sperry Rand Corporation, Troy, Mich.

Filed Feb. 17, 1972, Ser. No. 227,226
Int. Cl. F01c *1/18*
U.S. Cl. 418—206 **1 Claim**



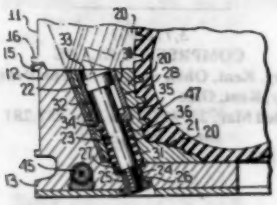
A gear pump or motor mounts the gears in the body by means of shaft journals projecting on opposite sides of each gear into bearings in the body. The bearing portions of the body are formed as cantilevers which are free to deflect under fluid pressure forces and follow the deflection of the shaft journals under the same forces. This reduces the localized loadings at the corners of the bearings and enables the device to operate at higher pressures than is possible with journal bearings solidly supported in the body.

3,778,203

MATRIX ASSEMBLY WITH SEGMENTED MATRICES

Kenneth T. MacMillan, 4992 Wesleyan Woods Dr., Macon, Ga.

Continuation-in-part of Ser. No. 90,687, Nov. 18, 1970, abandoned. This application Apr. 11, 1972, Ser. No. 243,366
Int. Cl. B29h *5/04*
U.S. Cl. 425—20 **6 Claims**



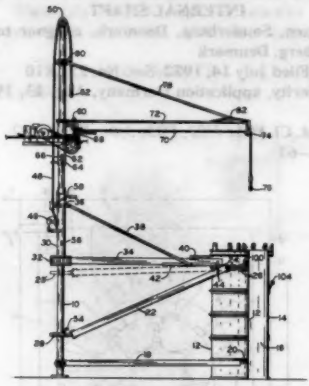
This disclosure relates to a matrix assembly for treading tires and includes a pair of matrix shell halves each of which has mounted therein segments which combine to define one half of a matrix. The matrix segments are resiliently urged out of the matrix shell in guided relation so that when the matrix assembly is open for the reception or discharge of a tire, the matrix segments are expanded so as to facilitate the loading and unloading of the matrix. A principal feature is the provision of wear retarding means whereby the matrix segments, which are normally formed of a relatively soft metal, such as aluminum, are not unduly worn as they shift relative to the shell halves.

3,778,204

APPARATUS FOR ERECTING CONCRETE STRUCTURES

Ewald D. Kuck, R.R. No. 1 4247 Road 90, New Breman, Ohio

Filed Apr. 20, 1971, Ser. No. 135,598
Int. Cl. E04g *11/22*
U.S. Cl. 425—63 **14 Claims**



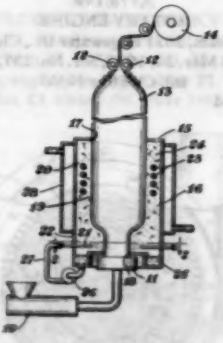
An apparatus, for erecting concrete structures, particularly cylindrical structures, such as silos. The apparatus includes axial form sections with the structure beng erected by pouring concrete into one form section consisting of inner and outer forms with a second portion of the structure being poured in a second set of forms mounted on top of the first set. Further portions of the structure are poured by removing the lower set of sections and setting them on top of the upper set of sections, and continuing this shifting of forms until the structure is completely erected. A center pole erected on the axis of the structure includes winches for lifting the forms and a plurality of radially extending braces can also be included on the center pole for bracing the forms against movement.

3,778,205

APPARATUS FOR COOLING BLOWN POLYMER FILMS

Robert Burton Turner, Lake Jackson, Tex., and Emilio Lawrence Poli, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 11, 1970, Ser. No. 57,877
Int. Cl. B29c *25/00*
U.S. Cl. 425—71 **5 Claims**



This invention relates to the cooling of blown polymer film by spraying a relatively low boiling point liquid onto the film, thereby causing cooling and solidification of the heat plastified polymer. The vaporized liquid coolant is condensed on the exterior wall of a cooling chamber which surrounds the blown film and the condensate is collected and re-cycled.

3,778,206

APPARATUS FOR PRODUCING CEMENT SHEETS

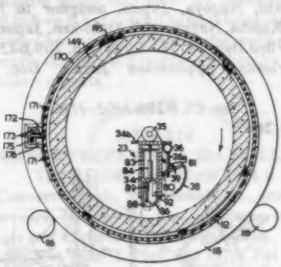
William C. Barratt, 595 Sheppard St., Niagara Falls, Ontario, Canada

Continuation-in-part of Ser. No. 166,780, July 28, 1971, abandoned. This application Jan. 3, 1973, Ser. No. 320,768

Claims priority, application Great Britain, Feb. 1, 1972, 4712/72

Int. Cl. B28b *21/08*

U.S. Cl. 425—86 16 Claims



Apparatus for producing a cement sheet, including a rotatable mould into which a cement mix is fed to form a soft, centrifugally moulded cylinder, which is then removed from the mould, divided longitudinally, and laid out flat to harden. The mould is initially fitted with a flexible liner of metal, rubber or plastics. The soft cement cylinder is removed by means of a mandrel inserted into the cylinder while in the mould. During removal from the mould, the cement cylinder is held onto the mandrel either by vacuum applied to perforations in the wall of the mandrel, or by connecting together the edges of the liner which surrounds the cylinder while it is removed from the mould on the mandrel. The longitudinal division in the cement cylinder may be formed by a longitudinal inwardly projecting member within the mould or forming part of the liner, or by slitting the cylinder on the mandrel after its removal from the mould. The apparatus is particularly useful for producing small quantities of asbestos cement sheets with special laminations or surface effects. Apparatus in accordance with the invention may be used for producing sheets of flowable hardenable material other than cement.

3,778,207

APPARATUS FOR MOLDING THERMOPLASTIC LAMINATE, SHOWING STRIP VARIEGATIONS

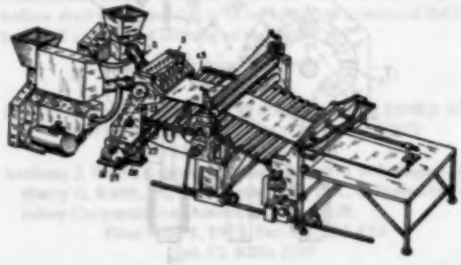
Marisa Luraschi, c/o Cicogna Franco & Co. 14a Via Visconti di Modrone, Milano, Italy

Continuation-in-part of Ser. No. 50,504, June 29, 1970, Pat. No. 3,718,413. This application May 11, 1971, Ser. No. 142,225

Claims priority, application Italy, May 13, 1970, 24565 A/70

Int. Cl. B29f *1/12, 3/12*

U.S. Cl. 425—131 5 Claims



A machine for the manufacture of a thermoplastic laminate, showing multiform interlacing variegations, including two or more extruders, supplying the thermoplastic material to two different ducts one of which is connected to a die-plate, consisting of a main duct connected to a distribution duct adjacent a cavity in which there is accomodated a rotary screw conveyor and provided with grooves at its peripheric surface, said screw conveyor supplying the molten thermoplastic material to the openings of the die-plate disposed perpendicular to the main duct and communicating with the flow of molten thermoplastic material conveyed by the other extruder according to the patent application Ser. No. 50,504, filed June 29, 1970, now U.S. Pat. No. 3,718,413, the improvement residing in the fact that the aforesaid openings of the die-plate are arranged in groups of two or more openings, said groups being spaced from each other.

3,778,208

APPARATUS FOR THE MANUFACTURE OF ECCENTRIC CORE/SHEATH CONJUGATE FILAMENTS

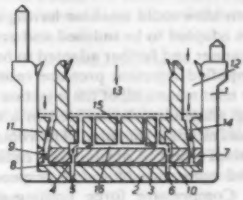
Douglas Chisholm Bisset, and Kenneth Mervyn Pugh, both of Pontypool, England, assignors to Imperial Chemical Industries Limited, London, England

Filed June 19, 1972, Ser. No. 263,905

Claims priority, application Great Britain, June 18, 1971, 28,765/71

Int. Cl. D01d *3/00*

U.S. Cl. 425—131 6 Claims



Apparatus for the manufacture of sheath/core conjugate filaments in which the sheath component flows into a channel containing a dilobate end portion formed in a plateau on the surface of a spinneret plate and is extruded through an extrusion orifice contained in a counter-bore communicating with the dilobate channel, the core forming material being injected through a D-shaped orifice into the same counter-bore to yield a filament having an eccentrically located D-shaped core.

3,778,209

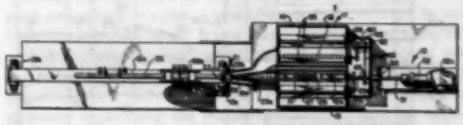
EXTRUDER FOR FOOD PRODUCTS SUCH AS TAMALES

Paul K. Wallace, and Banjamin K. Wallace, both of Salt Lake City, Utah, assignors to Dan Morrison Meat Pies, Inc., Salt Lake City, Utah

Filed Dec. 16, 1971, Ser. No. 208,869

Int. Cl. A21c *11/14*; B29f *3/01, 3/12*

U.S. Cl. 425—133 7 Claims



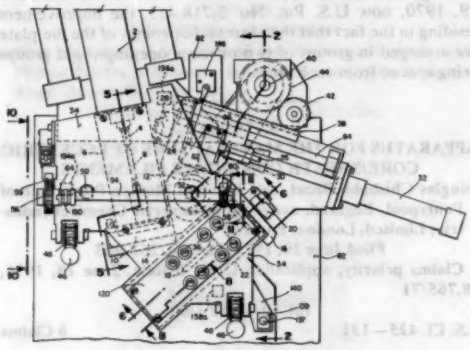
A food product suitable for deep frying in either a fresh or a frozen state, wherein an inner meat food is totally enrobed by an outer moldable food, such as potato, and a machine capable of continuously extruding the food product.

3,778,210

INJECTION BLOW MOLDING MACHINE

Harry Garett Heath, Jr., Milmay, and Carl Holzapfel, Ocean City, both of N.J., assignors to Wheaton Industries, Millville, N.J.

Filed Jan. 5, 1972, Ser. No. 215,524
Int. Cl. B29c *1/00*; B29f *1/00*
U.S. Cl. 425—242 **15 Claims**



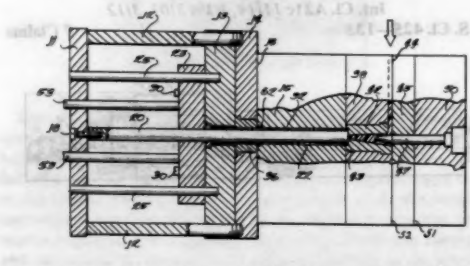
An injection blow mold machine having a rotary wheel indexing means adapted to be indexed and precisely positioned in a simple manner and further adapted to be used in conjunction with simplified injection pressure resistance means and simplified air inlet means, all of the injection blow molding apparatus being adapted to be utilized in a modified conventional injection molding machine. The rotary wheel indexing means comprises a central portion with radial arms extending therefrom and core rods mounted perpendicularly on said radial arms. Compressive force limiting means interposed between the blow mold and the movable platen on which the movable injection and blow mold halves are mounted distributes a disproportionately greater stress to the injection mold than to said blow mold. Still other unique features of the machine include a 360°–180° limit switch and precise and simple means for positioning molds in the apparatus mold receiving members.

3,778,211

PLASTIC INJECTION MOLD APPARATUS

Raymond S. Moen, Melrose Park, and Edward T. Sanelli, Buffalo Grove, both of Ill., assignors to Redmer Plastics, Inc., Franklin Park, Ill.

Filed Dec. 27, 1971, Ser. No. 211,932
Int. Cl. B28b *1/24*
U.S. Cl. 425—245 **3 Claims**



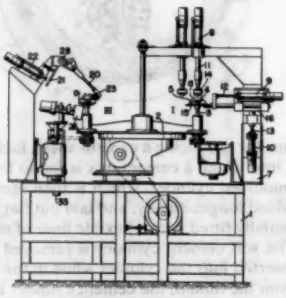
Apparatus for injection molding of hollow plastic articles having substantially uniform wall thickness throughout. Plastic is injected into a mold cavity around an article-defining core member. Associated with the core member is a movable sleeve member which controls the disposition of the plastic material around the core and retains the core centrally located within the cavity.

3,778,212

APPARATUS FOR FORMING AND FINISHING CERAMIC WARE FOOT

Koji Takahashi, Nagoya, Japan, assignor to Nippon Toki Kabushiki Kaisha, Nagoya-shi, Aichi-ken, Japan

Filed Dec. 20, 1971, Ser. No. 209,643
Claims priority, application Japan, Dec. 21, 1970, 45/114926
Int. Cl. B28b *1/02, 1/29*
U.S. Cl. 425—264 **12 Claims**



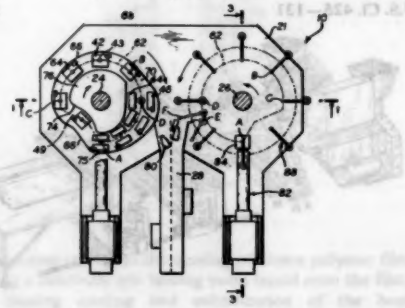
Apparatus for forming and finishing ceramic ware foot the operations of which are carried out while high speed rotating spindles are intermittently driven. The apparatus comprises a vertically movable pressing head which is engageable with a work piece and a vertically movable work-piece supporter. The centering and fixing of the work piece is carried out by the co-operation of the pressing head and the supporter. In operation, when the spindles are intermittently rotated a cutting of ceramic ware foot, a rough cutting of rim, roller finishing and damp finishing of said foot and said rim are simultaneously carried out at a plurality of operating stations.

3,778,213

APPARATUS FOR MASS PRODUCING HOLLOW OBJECTS

Antoine Di Settembrini, 4 Avenue Alfred de Vigny, F-95, Soisy-sous-Montmorency, France

Filed Apr. 6, 1972, Ser. No. 241,644
Int. Cl. B29d *23/03*
U.S. Cl. 425—326 B **12 Claims**



An apparatus for mass producing hollow objects, such as bottles, wherein the objects are formed from molds which are

moved along a predetermined path and are injected with a hot plastically deformable material, such as plastic, at a first station along said path. Gas is thereafter blown into the mold thereby forming a hollow object therein. When the object in each mold cools down enough so that it may be removed without self-deformation, it is so removed at a second station along the path. The object is then held apart from, and preferably in tracking relation with, the mold wherein it is further cooled to a lower finishing temperature as the mold continues to move along its path. The object is then released at a third station along said path. By removing each object from a mold before it has cooled to said finishing temperature, such object may be cooled faster and the mold may be refilled more frequently during each operation thereby increasing the output of hollow objects.

3,778,214

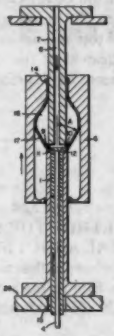
APPARATUS FOR PREPARING A BIAXIALLY ORIENTED THERMOPLASTIC ARTICLE

Nathaniel Convers Wyeth, Mendenhall, Pa., and Ronald Newman Roseveare, Lynchburg, Va., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 93,571, Nov. 30, 1970, Pat. No. 3,733,309, which is a continuation-in-part of Ser. No. 885,853, Dec. 17, 1969, abandoned. This application June 14, 1972, Ser. No. 262,593

Int. Cl. B29d *23/03*

U.S. Cl. 425—326 **31 Claims**



Apparatus for preparing a biaxially oriented thermoplastic article, particularly a bottle useful in bottling liquids under pressure such as carbonated beverages. The apparatus is comprised of a sliding mold, an annular extrusion orifice located within the mold cavity, means for extruding a hollow slug through the extrusion orifice, means in the mold to accept the extruded slug, means for sliding the mold from a first location to a second location relative to the extrusion orifice while the slug is continuously extruded to draw the extruded slug into the interior of the mold forming a hollow shell out of the extrudate, and means to introduce a fluid into the interior of the hollow shell while the slug is being extruded to expand the hollow shell against the interior of the mold.

3,778,215

ROTATIONAL MOULDING MACHINE WITH INNER AND OUTER MOLD CAGES ROTATING ABOUT INTERSECTING AXES

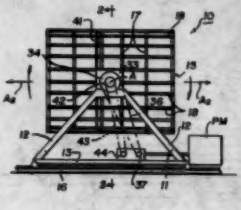
Anthony J. Starr; Gustave A. Shindel, both of Wilmington, and Harry G. Keith, Jr., New Castle, all of Del., assignors to Container Corporation of America, Chicago, Ill.

Filed Sept. 1, 1972, Ser. No. 285,610

Int. Cl. B28b *1/20*

U.S. Cl. 425—435 **4 Claims**

A machine for moulding a body by rotating a mould about a pair of intersecting axes comprises a pair of frames supporting an outer mould cage for rotation about the first of said axes, and an inner mould cage supported along exterior cylindrical surfaces thereof within the outer mould cage and supporting a mould for rotation with said inner mould cage about the second of said axes. Driving means for both of the cages is mounted on one of the frames and turns about a single axis and comprises a first driving shaft operatively connected to the outer mould cage to rotate same about the first axis, and a second drive shaft nesting with the first driving shaft and having an operative connection with the inner mould cage for rotating same about the second axis. The operative connection between the inner mould cage and the second driving shaft comprises an endless driven member supported on the cylindrical surfaces of the inner mould cage, and a driving member fast on the second driving shaft and engageable with the endless driven member. The mould is capable of being adjusted in its position within the inner mould cage, so that the machine at all times operates in a condition substantially of both static and dynamic balance.



3,778,216

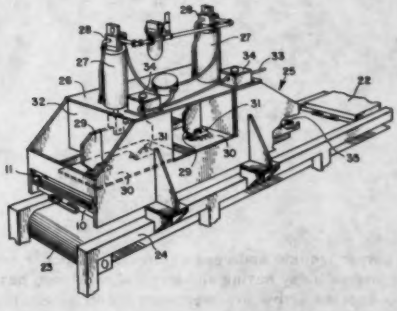
MOLDS FOR USE IN FREEZING FOOD PRODUCTS TOGETHER WITH MEANS TO EJECT THE FROZEN BLOCKS FROM THE MOLD FRAMES

Remi Harold Gowen, Standish, Maine, assignor to Gowen, Inc., Portland, Maine

Filed May 13, 1971, Ser. No. 143,087

Int. Cl. B28b *13/04*

U.S. Cl. 425—444 **1 Claim**



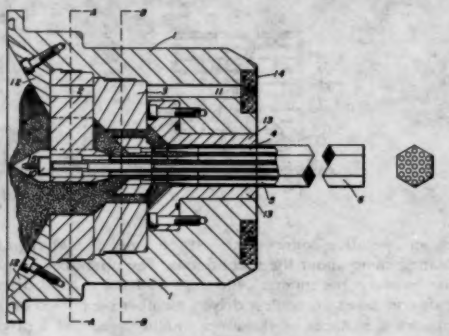
Molds are disclosed for use in the freezing of food products, each consisting of a pan, a mold frame, and a cover. The outer face of each side of the frame has a channel extending from end-to-end thereof and providing a shoulder exposed when the cover is removed above the pan. An ejector straddles the infeed end of a pan conveyor and has side supports providing a slideway underlying the frame shoulders to slidably support the food filled frame and the pan frozen to the bottom thereof above the conveyor with the frame held horizontally and against any material side-to-side play. The ejector has air-operated means operable to engage each food block and push it downwardly from its frame so that it and the pan drop to the conveyor with the resulting jolt freeing the block from the pan.

3,778,217

EXTRUSION DIE

Santiago J. Bustamante, and Donald H. Schell, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Oct. 31, 1963, Ser. No. 320,587
Int. Cl. B29c 17/00
U.S. Cl. 425—467 5 Claims



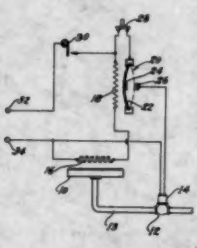
1. An extruding die for extruding an article having a multiplicity of ducts through its length, comprising a plurality of spiders, a plurality of pins extending from each of said spiders, one spider having a central duct and an off-center duct so that the material to be extruded can pass through both ducts.

3,778,218

IGNITION AND CONTROL SYSTEMS FOR GAS BURNERS

James A. Wright, Webster Groves, Mo., and Robert L. Forrest, Edwardsville, Ill., assignors to Emerson Electric Co., St. Louis, Mo.

Int. Cl. F23h 5/20
U.S. Cl. 431—67 4 Claims



A burner ignition and control circuit in which a normally open thermal relay having an electrical resistance heater series connected across a power source with an electrical resistance glow igniter closes to effect the energization and opening of a normally closed solenoid gas vale when the igniter and resistance heater have been energized for a period of time sufficient to insure that the igniter has attained gas ignition temperature.

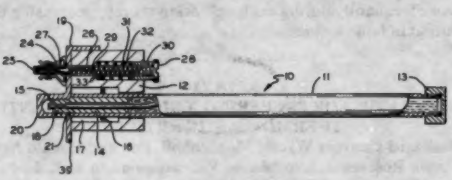
3,778,219

SEALED LIGHTER

Thomas M. Owens, Wanakena, N.Y.

Filed Nov. 15, 1972, Ser. No. 306,600
Int. Cl. F23q 25/00
U.S. Cl. 431—152 2 Claims

A lighter, of the type having a tubular fluid and wick container on which a lighter head is slideably mounted, has a plate-like cover on one end of the head, to which is secured a rotatable steel wheel, a cap for the wick-bearing end of the container and a flint carrying tube. The cover is rotatable about the flint tube as pivot from a position in which the cap is aligned with the container to a position uncovering the wick end of the container and in which the wheel is in position for lighting the wick. The cap is internally threaded and the wick end of the container has a neck around the wick which is threaded for engagement within the cap. The cap and neck have mating ground seats thereon so that the container may be



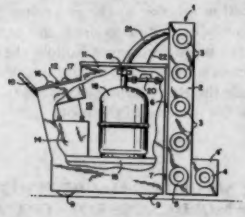
rotated to seal the wick end of the container. The other end of the container has a removable stop and closure member. The cover is normally spring biased against the end of the head and has a leg at 90° to the cover normally in engagement with one of two adjacent flat sides of the head, the lineal corner between the flat sides having an arcuate groove in its end adjacent the cover so that the cover can only be rotated when it is withdrawn away from the head to clear the wick-bearing end of the container. Stop means are provided on the container to prevent withdrawal of the container from the head when the cap and container neck are not in engagement.

3,778,220

APPARATUS AND METHOD FOR SHRINKING PLASTIC SHEET MATERIAL ABOUT STACKED GOODS

Heinrich Ahrendt, Monchengladbach-Hehn, and Karl Birkendahl, Niederkruchten-Elmpt, both of Germany, assignors to Ahrendt & Birkendahl oHG, Monchengladbach-Hehn, Germany

Filed Oct. 24, 1972, Ser. No. 299,115
Claims priority, application Germany, Oct. 25, 1971, P 21 53 001.8
Int. Cl. F27d 9/14
U.S. Cl. 432—5 11 Claims



Forced-draft gas burners mounted on a support in vertically offset relationship discharge respective streams of combustion gases against a stack of goods loosely enveloped in a bag of heat-shrinkable plastic sheet material. To reach all sides of the stack, the support may be mounted on a wheeled carriage and moved around the stack, or the stack may be moved on a turntable relative to the stationary support. The top of the

stack may be reached by combustion gases from a separate, downwardly directed burner or by gases originating in burner units directed against the side of the stack and deflected toward the top by an adjustable hood.

3,778,221

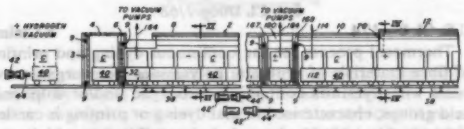
ANNEALING FURNACE AND METHOD FOR ITS OPERATION

William M. Bloom, Pittsburgh, Pa., assignor to Allegheny Ludlum Industries Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 802,548, Feb. 26, 1969, Pat. No. 3,606,289. This application Sept. 17, 1971, Ser. No. 181,504

Int. Cl. F27b 9/02

U.S. Cl. 432—11 **14 Claims**



A furnace, and method of furnace operation, for annealing whole coils of steel, particularly silicon steel. The furnace includes a welded gas-tight shell lined with varying thicknesses of refractory material defining a plurality of independently controllable heating and cooling zones and in which a vacuum is maintained at the entry section and a hydrogen atmosphere in all other sections. The furnace additionally includes vacuum-purged vestibules at both ends to accommodate the entrance and exit of coils from the interior atmosphere of the furnace.

3,778,222

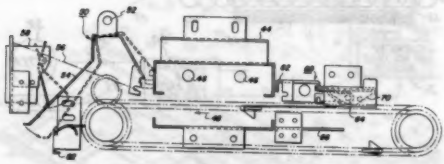
FIRE PREVENTION APPARATUS

Katsuo Suzuki, Tokyo, Japan, assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 18, 1972, Ser. No. 290,018

Int. Cl. F27b 9/14

U.S. Cl. 432—35 **10 Claims**



An apparatus in which an article passageway through a fusing device is closed to prevent a fire originating therein from spreading therefrom.

The foregoing abstract is neither intended to define the invention disclosed in the specification, nor is it intended to be limiting as to the scope of the invention in any way.

3,778,223

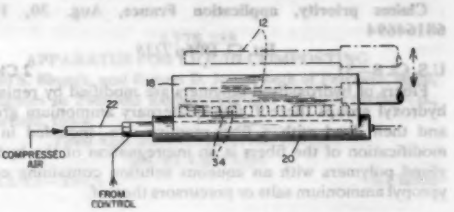
DEVICE FOR INJECTION BLOW MOLDING PVC BOTTLES

Theodore C. Wheaton, III, Ocean City; Albert J. Tamagni, Vineland, and Robert W. Moshinsky, Blackwood, all of N.J., assignors to Wheaton Industries, Millville, N.J.

Filed Oct. 18, 1971, Ser. No. 189,930

Int. Cl. F27d 3/00

U.S. Cl. 432—227 **1 Claim**



Core rods or mandrels, on which PVC parisons are first injection molded and subsequently blown into bottles, are thermally conditioned prior to injection molding of the parison thereon, by a heating unit including means for selectively heating various segments of the core rod along the length thereof. In the preferred form of the present invention, compressed air is passed through a tubular electrical resistance heating element along the length thereof and reversed at one end thereof so as to pass in an opposite direction through an annular space surrounding the tubular heating element. The outer wall of the annular space includes numerous openings aligned with the core rod to be thermally conditioned, each of these individual openings being disposed so as to direct heated air onto a preselected segment of the core rod. Preferably the device also includes baffles or side walls to direct the heated air over the core rod being treated.

3,778,224

JIG FOR FIRING OF CERAMIC SPARK PLUG INSULATION

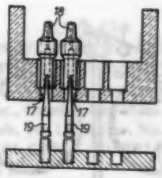
Josef Duffner, Bamberg, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Mar. 3, 1972, Ser. No. 231,606

Claims priority, application Germany, Mar. 16, 1971, P 21 12 507.5

Int. Cl. F27b 21/00

U.S. Cl. 432—258 **6 Claims**



A jig for firing of stepped-diameter ceramic spark plug insulators has a bottom wall which is provided in its upwardly directed surface with a plurality of apertures each of which is adapted to accommodate a spark plug insulator during firing. Each of the apertures has a wider portion extending inwardly from the upper surface and emerging into a narrower portion which extends to the lower surface of the bottom wall. Side walls may or may not be provided extending upwardly from the upper surface.

CHEMICAL

3,778,225
REACTIVE DYEING OF EPOXY ALKYL QUATERNARY AMMONIUM CELLULOSE OR POLYVINYL ALCOHOL TEXTILES

Georges Cuvelier, Sotteville-les-Rouen, and Daniel Wattiez, Saint-Etienne-Durouvray, both of France, assignors to Institut Textile de France, Boulogne-sur-Siene, France

Filed June 26, 1972, Ser. No. 266,330

Claims priority, application France, Aug. 30, 1968, 68164694

Int. Cl. D06p *1/38*

U.S. Cl. 8—31 **2 Claims**

Fibers of hydroxylised polymers are modified by replacing hydroxyl groups thereof with quaternary ammonium groups and then dyed with a fiber-reactive dye. Included in the modification of the fibers is an impregnation of the hydroxylised polymers with an aqueous solution containing epoxypropyl ammonium salts or precursors thereof.

3,778,226
DURABLE-PRESS AND SOIL-RELEASE COMPOSITIONS

Erik Kissa, Wilmington, Del., assignor to E. I. du Pont de Nemours and Co., Wilmington, Del.

Filed Apr. 15, 1970, Ser. No. 28,924

Int. Cl. D06m *15/56, 15/58*

U.S. Cl. 8—115.5 **3 Claims**

A durable-press soil-release agent comprising a durable-press aminoplast resin precursor, a selected water soluble organic acid or sulfonic acid salt containing amino or hydroxyl groups, and a selected surface active agent.

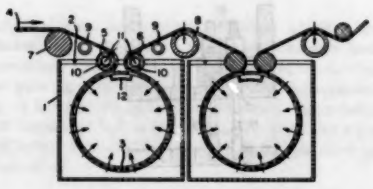
3,778,227
PROCESS FOR THE WET-TREATMENT OF LIQUID PERMEABLE MATERIALS

Heinz Fleissner, Wolfsgartenstrasse 6, Frankfurt/Main, Germany

Division of Ser. No. 687,320, Dec. 1, 1967, Pat. No. 3,608,340. This application July 17, 1970, Ser. No. 62,774

Int. Cl. B05c *8/04*

U.S. Cl. 8—151 **6 Claims**



The present disclosure relates to a process and apparatus for the wet-treatment preferably for washing and impregnating liquid-permeable materials which can be stressed in the lengthwise direction. More particularly, the present disclosure is directed to a process and apparatus for washing and impregnating textile materials wherein during the treatment process, advantageously after the material has been wet-treated, said material is vacuum extracted to draw off particles which have floated onto the textile material during said treatment process.

3,778,228
PROCESS FOR THE CONTINUOUS DYEING AND PRINTING OF FIBRE MATERIALS OF SYNTHETIC POLYAMIDES

Robert Kuth, Cologne; Dietrich Hildebrand, Odenthal, and Hans-Samuel Bien, Burscheid, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 6, 1970, Ser. No. 61,805

Claims priority, application Germany, Aug. 13, 1969, P 19 41 105.3

Int. Cl. D06p *1/68*

U.S. Cl. 8—174 **5 Claims**

Thermosol process for the continuous dyeing and printing of fibre materials of synthetic polyamides from organic solvents with dyestuffs containing carboxylic and/or sulphonic acid groups, characterised in that dyeing or printing is carried out with chlorinated hydrocarbon dyestuff liquors which contain amine salts or amine addition products of dyestuffs containing carboxylic and/or sulphonic acid groups, which are derived from an amine containing at least eight carbon atoms and exhibiting an uninterrupted chain of at least three carbon atoms. With the aid of the process according to the invention it is possible to produce on fibre materials of synthetic polyamides intense, level and well developed dyeings and prints with an excellent dyestuff yield.

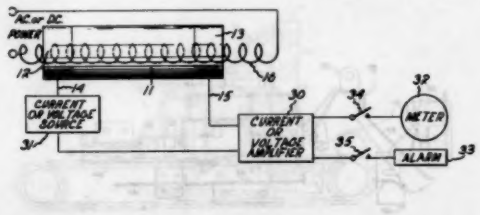
3,778,229
OZONE GAS DETECTOR

Harold F. Webster, Scotia, and Lawrence A. Harris, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 29, 1972, Ser. No. 239,215

Int. Cl. G01n *27/14*

U.S. Cl. 23—254 E **1 Claim**



A tubular substrate of high electrical resistivity is provided with a metal oxide coating whose resistance increases significantly with ozone concentration in the atmosphere. Electrodes connected to the metal oxide coating at the tube ends provide a means for connection to an electronic circuit for obtaining a signal of level sufficient to operate a meter or alarm device.

3,778,230

METHOD OF AUTOMATICALLY ANALYZING AMINO ACIDS BY LIQUID CHROMATOGRAPHY AND COLOR-DEVELOPING SOLUTION THEREFOR

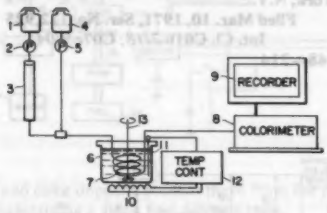
Yoshijiro Arikawa, 3-20-22 Ose-cho; Seiji Takeuchi, 3-13-1 Ose-cho, both of Hitachi, and Hisayuki Sagusa, 1030, Ichige, Katsuta, all of Japan

Filed Dec. 27, 1971, Ser. No. 212,197

Claims priority, application Japan, Dec. 25, 1970, 45/117605

Int. Cl. G01n *31/22*

U.S. Cl. 23—230 M 15 Claims



A color-developing solution for use in automatic amino acid analysis by liquid chromatography, which comprises ninhydrin, an organic solvent, a buffer and ascorbic acid as a reducing agent for ninhydrin in an amount of from 0.2×10^{-3} to 0.5×10^{-3} mole per liter of solution.

3,778,231

METHOD OF PRODUCING SILICON NITRIDE ARTICLES

Richard Alan Taylor, Coldfield, England, assignor to The Birmingham Small Arms Company Limited, Birmingham, England

Continuation-in-part of Ser. No. 749,987, Aug. 5, 1968, abandoned. This application Mar. 11, 1971, Ser. No. 123,431

Int. Cl. C01b *21/06*; B29f *5/02*

U.S. Cl. 423—290 3 Claims

A method of producing a silicon nitride article comprising forming an article as a compact of silicon powder, sintering the silicon compact in an atmosphere substantially free of nitrogen, machining the silicon compact to a required accuracy, and nitriding the machined silicon compact to produce the silicon nitride article.

3,778,232

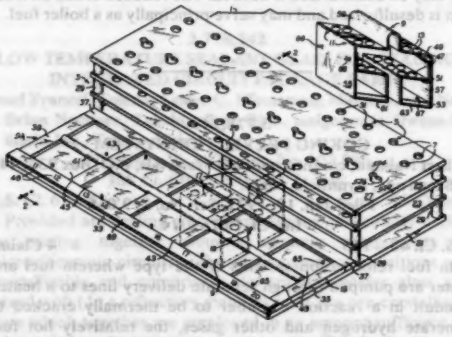
BLOOD TYPING SYSTEM

John J. McMorrow, Jr., 652 W. 170th St., New York, N.Y.

Filed Nov. 26, 1971, Ser. No. 202,486

Int. Cl. B01l *9/00*

U.S. Cl. 23—253 R 25 Claims



A blood typing system comprises a first section having a plurality of lines of test tube holding means. A second section has a plurality of lines of test tube holding means, each line in said second section associated with only one line in said first section. Receiving means positively aligns each line in said second section with its associated line in said first section. Preferably said second section is a removable centrifuge carrier. Other additional means are disclosed which comprise a better blood typing system.

3,778,233

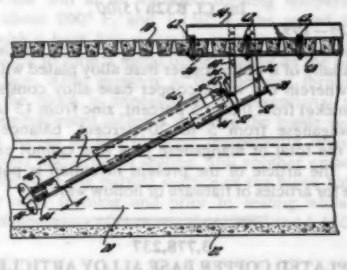
APPARATUS FOR LIQUID COMPOSTING

Ronald S. Blough, and Robert D. Jones, both of Fairfield, Iowa, assignors to Fairfield Engineering and Manufacturing Co., Fairfield, Iowa

Filed Apr. 20, 1971, Ser. No. 135,597

Int. Cl. C05f *3/06*

U.S. Cl. 23—259.1 8 Claims



The apparatus generally comprises an elongated hollow shaft having a propeller secured to its lower end and driven at its upper end by a motor mounted on a swingable frame. Air may enter the upper end of the shaft and may exit adjacent the propeller. Rotation of the shaft and propeller thus induces air into the material. The shaft is immersed in the material at an angle to break the air into a multitude of fine bubbles while simultaneously moving the material around the reservoir.

3,778,234

PROCESS FOR GROWING CRYSTALS USING AN OZONE ENRICHED HYDROGEN-OXYGEN FLAME

Carolus Cobb, Arlington, Mass., assignor to American Science & Engineering, Inc., Cambridge, Mass.

Filed Feb. 14, 1972, Ser. No. 226,253

Int. Cl. C09k *1/10*; B01j *17/24*

U.S. Cl. 252—301.4 R 3 Claims

A flame fusion process for the formation of high melting refractory oxide single crystals using a hydrogen-oxygen flame substantially enriched in ozone. The enrichment of the flame with ozone increases burning speed, thereby reducing flame size and increasing flame temperature. This produces a more closely confined flame area permitting the growth of new single crystalline materials, such as beryllium oxide, magnesium oxide, barium zirconate, calcium oxide, etc. Single crystals grown in accordance with this invention have utility as superior integrated circuit substrates and high energy solid state laser hosts.

3,778,235
NITRIDE-STRENGTHENED STAINLESS STEEL COMPOSITE
Lynn E. Kindlimann, Natrona Heights, and Alexander B. Greene, New Kensington, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.
Division of Ser. No. 803,442, Feb. 28, 1969, Pat. No. 3,672,037. This application Nov. 19, 1971, Ser. No. 200,504
Int. Cl. B32b 15/00
U.S. Cl. 29—196.1 10 Claims

The application describes composite members containing a plurality of layers at least one of which is nitride strengthened stainless steel and a pressure bonding method for producing them.

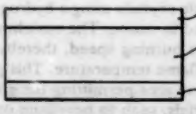
3,778,236
PLATED COPPER BASE ALLOY ARTICLE
Alan J. Goldman, Silver Springs, Md., and Stanley Shapiro, New Haven, Conn., assignors to Olin Corporation, New Haven, Conn.
Continuation-in-part of Ser. No. 143,220, May 13, 1971, which is a continuation-in-part of Ser. No. 867,358, Oct. 17, 1969, abandoned. This application Mar. 29, 1972, Ser. No. 239,308
Int. Cl. B32b 15/00
U.S. Cl. 29—199 9 Claims

The instant disclosure teaches an improved article consisting essentially of a white copper base alloy plated with a silver plating, wherein the white copper base alloy consists essentially of nickel from 0.5 to 5 percent, zinc from 15 to 35 percent, manganese from 5 to 20 percent, balance copper, wherein the total of manganese plus zinc cannot exceed 40 percent. The article of the present invention is particularly desirable for articles of flatware or hollow ware.

3,778,237
PLATED COPPER BASE ALLOY ARTICLE
Stanley Shapiro, New Haven; Derek E. Tyler, Cheshire, and Michael J. Pryor, Woodbridge, all of Conn., assignors to Olin Corporation, New Haven, Conn.
Continuation-in-part of Ser. No. 65,277, Aug. 19, 1970, which is a continuation-in-part of Ser. No. 9,997, Feb. 9, 1970, abandoned. This application Mar. 29, 1972, Ser. No. 239,309
Int. Cl. B32b 15/00
U.S. Cl. 29—199 9 Claims

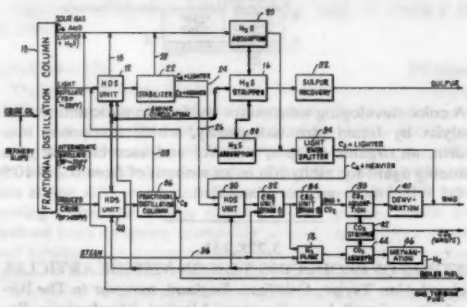
The instant disclosure teaches an improved article consisting essentially of a white copper base alloy plated with a silver plating. The white copper base alloy substrate consists essentially of a substantially nickel-free alloy containing manganese in an amount from 8 to 16 percent, zinc in an amount from 20 to 31 percent, balance essentially copper. The article of the present invention is particularly desirable for articles of flatware or hollow ware.

3,778,238
COMPOSITE METAL ARTICLE
Derek E. Tyler, 53 Elmwood Dr., Cheshire, and Stanley Shapiro, 1860 Boulevard, New Haven, both of Conn.
Filed Apr. 14, 1972, Ser. No. 244,113
Int. Cl. B32b 15/00
U.S. Cl. 29—196.3 8 Claims



The present disclosure teaches a composite metal article having a variety of uses, especially for the manufacture of jewelry. The composite of the present invention is a copper base alloy containing from 5 to 40 percent manganese bonded to nickel or a nickel base alloy or stainless steel. Additional layers may be bonded to this composite, such as a thin layer of a gold filled alloy or other decorative metal or alloy.

3,778,239
PRODUCTION OF GASEOUS AND LIQUID FUELS FROM CRUDE OIL
Gerard C. Gambs, New York, N.Y.; William H. Nix, Westfield, N.J.; James H. Barnhart, and John G. Cathcart, both of Dallas, Tex., assignors to Ford, Bacon & Davis, Incorporated, New York, N.Y.
Filed Mar. 10, 1971, Ser. No. 122,925
Int. Cl. C01b 2/18; C07c 9/04
U.S. Cl. 48—214 4 Claims



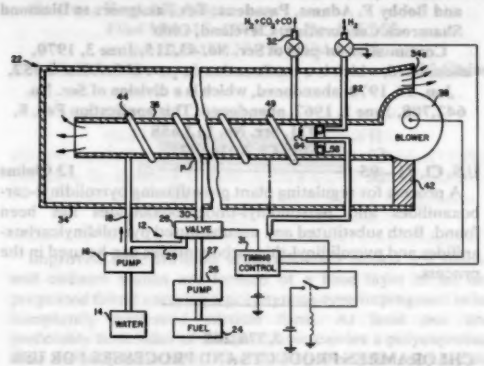
Method of producing gaseous and liquid fuels from crude oil involving fractionally distilling crude oil to four basic fractions: (1) a light distillate composed of hydrocarbons that boil at less than about 350° F.; (2) an intermediate distillate composed of hydrocarbons having a boiling range of from about 320° F. to about 420° F.; (3) a reduced crude oil residue, i.e., heavier hydrocarbons that boil at greater than about 420° F., and (4) sour gas, i.e., hydrocarbons principally having four or less carbon atoms and H_2S.

The light distillate fraction is treated to desulfurize it and then is further processed by catalytic treatment to produce synthetic natural gas, i.e., methane-rich gas. The sour gas fraction is desulfurized and used directly or catalytically enriched as a component of the synthetic natural gas. The intermediate distillate fraction is typically used directly as gas turbine fuel, but may be desulfurized if desired. The reduced crude oil fraction is desulfurized and may serve principally as a boiler fuel.

3,778,240
COKING PREVENTION SYSTEM
Robert Naiman, c/o International Materials, P.O. Box 934, 445 Broadway, Lynnfield, Mass.
Filed Jan. 19, 1972, Ser. No. 219,066
Int. Cl. C01b 2/14
U.S. Cl. 48—105 4 Claims

In fuel reformation systems of the type wherein fuel and water are pumped through separate delivery lines to a heated conduit in a reaction chamber to be thermally cracked to generate hydrogen and other gases, the relatively hot fuel delivery tube tends to become clogged with coke deposits. In the present system, a slug of water is injected periodically into

the fuel delivery tube and this water vaporizes generating a high pressure which is sufficient to scrub the delivery tube of



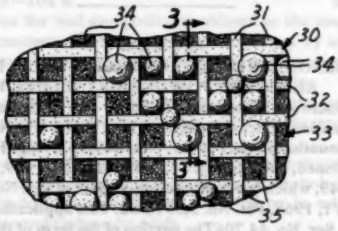
the gasoline and coke deposits present there from the previous cycle, thus maintaining a clean fuel delivery tube.

3,778,241

SPHEROIDAL PEENING PARTICLES ADHESIVELY BONDED TO A WOVEN CLOTH

Phillip M. Winter, and Gary A. Gardner, both of 2501 Hudson Rd., St. Paul, Minn.

Division of Ser. No. 746,366, July 22, 1968, Pat. No. 3,638,464. This application June 25, 1970, Ser. No. 59,850
Int. Cl. B32b 5/16
U.S. Cl. 161—87 **3 Claims**



A rotary wheel, in which spheroidal peening particles are affixed to radially extending circumferentially spaced flaps of fibrous sheet material, is used to impart compressive stress to, or aid in shaping, metallic substrates.

3,778,242

LOW TEMPERATURE SEALANT GLASS FOR SEALING INTEGRATED CIRCUIT PACKAGE PARTS

Josef Francel, Toledo; Lester C. Minneman, Maumee, and Neil Brian Nofziger, Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 30, 1970, Ser. No. 102,886
Int. Cl. C03c 27/00, 3/12, 3/30
U.S. Cl. 65—43 **18 Claims**

Provided are sealing glass compositions particularly useful for sealing together alumina ceramic components in microelectronic circuitry. The sealing glass compositions are crystallizable and comprise a devitrifiable solder glass admixed with (1) a refractory material and (2) a pre-crystallized glass which together are employed in an amount sufficient to substantially reduce the time necessary to effect in situ crystallization and at the same time form a strong hermetic seal. The sealing glass compositions may be employed in any conventional form and are fired at about 400°–500° C. for about one minute to less than about 60 minutes to form a seal as described.

3,778,243

METAL OXIDE COATED GLASS BLOCKS

William D. Johnston, Pittsburgh, Pa., assignor to Pittsburgh Corning Corporation, Pittsburgh, Pa.

Filed Nov. 10, 1971, Ser. No. 197,472
Int. Cl. C03b 23/24; C03c 17/00
U.S. Cl. 65—58 **9 Claims**

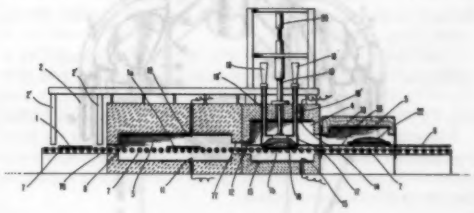
The method of preparing transparent metal oxide coated glass blocks includes forming the blocks in halves by positioning a molten mass of glass in a suitable mold that has a fixed bottom plate and a vertical exterior forming shell. A plunger is inserted into the mold to shape the molten mass of glass into a half of a glass block with an upwardly extending rectangular edge portion. While at an elevated temperature of above 1,000° F. the rectangular edge portions of two block halves are positioned in overlying abutting relation and are flame sealed. While still at an elevated forming temperature of between about 900° F. and 1,150° F. the sealed block is sprayed with a heat decomposable metal organic salt in organic solution to form a metal oxide coating on the block exterior surface. After spraying at this elevated forming temperature the block is annealed in a conventional manner. Another embodiment includes spraying the inside surface of the block halves at this elevated temperature immediately after forming and prior to sealing. Still another embodiment includes spraying the outside surface of the block halves immediately after forming and prior to sealing while at the elevated temperature of between about 900° and 1,150° F.

3,778,244

BENDING OF FLAT GLASS ON A MOLD WITH VACUUM

Maurice Nedelec, Versailles, and Jean-Marc Pettitcollin, Plessis-Brion, both of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Apr. 22, 1971, Ser. No. 136,501
Claims priority, application France, Apr. 23, 1970, 7014794
Int. Cl. C03b 23/02
U.S. Cl. 65—106 **29 Claims**



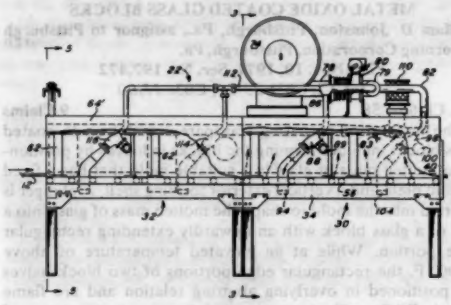
The invention involves a method of bending a sheet of thermoplastic material which comprises heating the sheet to bending temperature, placing it adjacent a shaping form, pneumatically forcing the sheet toward and bending it against the form, and cooling the bent sheet; and apparatus for the bending of thermoplastic sheets which comprises a bending form, means to transport a hot thermoplastic sheet into proximity to the bending form, pneumatic means to bend the sheet against the form, and means to cool the bent sheet.

3,778,245

METHOD AND APPARATUS FOR HEAT TREATING GLASSWARE

Willard Clark, Farmland, and Charles Campbell, Muncie, both of Ind., assignors to Maul Bros., Inc., Millville, N.J.

Filed Dec. 22, 1970, Ser. No. 100,636
Int. Cl. C03b 25/04
U.S. Cl. 65—119 12 Claims



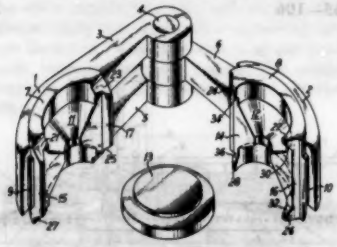
A heat treating lehr is disclosed wherein glassware is heated, annealed, precooled, and then cooled in that order. Precooling is done in a zone of the lehr having a vertical air curtain which prevents temperature drift due to air currents from the cooling zone flowing to the annealing zone.

3,778,246

MULTI-PART MOLD WITH MEANS FOR ALIGNING MOLD PARTS

Josef Rankl, Zwiesel, Germany, assignor to Vereinigte Farbenglaswerke Aktiengesellschaft, Zwiesel (Niederbayern), Germany

Continuation-in-part of Ser. No. 16,909, March 5, 1970, abandoned. This application Apr. 27, 1972, Ser. No. 248,250
Claims priority, application Germany, Mar. 7, 1969, P 19 11 600.8
Int. Cl. C03b 9/04
U.S. Cl. 65—360 6 Claims



A multipart mold in which at least two mold parts are mounted on hingedly connected arms for movement into and out of the molding position. In molding position, the parts form an annular body having an open bottom. The mold parts have projection-recess combinations for providing horizontal and vertical alignment of the mold parts. A bottom closure is provided, having a flange for receiving the lower edges of said mold parts and which cooperate with the projection-recess combinations to provide improved and distributed alignment of the mold parts.

3,778,247

METHOD FOR REGULATING PLANT GROWTH

William J. Pyne; James M. Gullo, both of Painesville, Ohio, and Bobby F. Adams, Pasadena, Tex., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 43,215, June 3, 1970, abandoned, which is a continuation-in-part of Ser. No. 8,152, Jan. 19, 1970, abandoned, which is a division of Ser. No. 642,708, June 1, 1967, abandoned. This application Feb. 8, 1971, Ser. No. 113,658
Int. Cl. A01n 9/22
U.S. Cl. 71—95 13 Claims

A process for regulating plant growth using pyrrolidinyl-carboxanilides and pyrrolidinyl-thiocarboxanilides has been found. Both substituted and unsubstituted pyrrolidinylcarboxanilides and pyrrolidinyl-thiocarboxanilides can be used in the process.

3,778,248

CHLORAMBEN PRODUCTS AND PROCESSES FOR USE WITH RICE

Warren E. Weston, Lansdale, Pa., and Anson R. Cooke, St. Thomas, V.I., assignors to Amchem Products, Inc., Ambler, Pa.

Filed Oct. 13, 1970, Ser. No. 80,490
Int. Cl. A01n 9/24
U.S. Cl. 71—115 7 Claims

Chloramben products and processes for use with rice wherein chloramben (3-amino-2,5-dichlorobenzoic acid) and its herbicidally active functional derivatives either alone or in conjunction with other herbicides or fertilizers is applied to the pool of water in which rice grows (known as a "paddy") such that the growing rice plant remains substantially unharmed while certain common rice paddy weeds are effectively controlled.

3,778,249

DISPERSION STRENGTHENED ELECTRICAL HEATING ALLOYS BY POWDER METALLURGY

John Stanwood Benjamin, Suffern, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. Nos. 849,133, Aug. 11, 1969, abandoned, and Ser. No. 853,327, Aug. 27, 1969, Pat. No. 3,660,049, which is a continuation-in-part of Ser. No. 709,700, March 1, 1968, Pat. No. 3,591,362. This application June 9, 1970, Ser. No. 44,706The portion of the term of this patent subsequent to July 6, 1988, has been disclaimed.
Int. Cl. B22f 9/00
U.S. Cl. 75—.5 BC 5 Claims

This invention relates to the powder metallurgy of wrought, dispersion strengthened, electrical heating elements characterized metallographically by a uniform distribution of dispersoids in both the longitudinal and transverse directions, and also to a powder metallurgy method for producing the same.

3,778,250

METHOD FOR TREATING METALLIC MELTS

Gert P. Bernsmann, Pittsburgh, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 802,518, Feb. 26, 1969, Pat. No. 3,615,085. This application Dec. 11, 1970, Ser. No. 97,384
Int. Cl. C21c 7/00; C22c 33/00
U.S. Cl. 75—58 7 Claims

Method and apparatus for treating a metallic melt, such as molten steel in a ladle, are disclosed. The apparatus includes an inner tubular member, through which an additive is delivered to within the melt, and a coaxially disposed outer tubular member, the annulus between the two tubular members serving as a passageway for gas delivered to the melt. The gas is introduced into the melt through a porous refractory element positioned about the ends of the tubular members.

3,778,251

SHOE STIFFENER MATERIALS

Blair D. Trask, Haverhill, Mass., assignor to Bixby Box Toe Co., Inc., Haverhill, Mass.

Filed Mar. 17, 1971, Ser. No. 125,055
Int. Cl. B32b *27/12*; A43d *31/00*
U.S. Cl. 117—68 12 Claims

Improved shoe stiffener materials such as box toe blanks and counter blanks are formed of a base layer of an impregnated fabric carrying a polystyrene-type impregnant in incompletely coalesced particle form. At least one and preferably both sides of the base layer carries a polycaprolactone thermoplastic layer. The shoe stiffener material is solid and non-tacky at standard room temperature and has sufficient softness and flexibility to permit ease of use in conventional box toe and shoe back part forming apparatus. Heat is used to form a continuous thermoplastic film of the polymers in the shoe stiffener when formed into three-dimensional box toes and counters. The heat also acts to adhesively unite the stiffener with surrounding layers such as shoe uppers and shoe linings.

3,778,252

PROCESS FOR SEPARATION AND RECOVERY OF GOLD

Harold W. Wilson, El Paso, Tex., assignor to The Golden Cycle Corporation, Victor, Colo.

Filed Feb. 12, 1970, Ser. No. 11,011
Int. Cl. C22b *3/00*, *11/04*
U.S. Cl. 75—101 R 18 Claims

Processes for and compositions utilized in the recovery of the gold content of gold containing substances by subjecting such substances —preferably in comminuted form— to the action of one of the following solvent system families:

A. Aqueous gold solvation systems comprising primary or secondary mono-hydroxy alcohols, saccharides and/or carboxylic acids and iodine or bromine.

B. Aqueous iodine-containing gold solvation systems comprising primary or secondary monohydroxy alcohols and ditri- and polyhydric alcohols in the place of or in addition to saccharides and carboxylic acids.

C. Essentially non-aqueous gold solvating systems comprising secondary alcohols and iodine.

Solvation of the gold occurs during agitation and heating of the slurry. The gold contents are removed from the gold pregnant solution by displacement onto a non-noble metal surface. The solid gold containing residue is treated with sufficient aqueous hydroxide solution to convert excess non-noble metal into its water-soluble salt. The remaining insoluble material containing the gold metal recovered is rinsed to remove any remaining unreacted alkali and the soluble salts and is then digested with concentrated sulfuric acid to dissolve any remaining acid soluble impurities, the remaining acid insoluble residue is rinsed, dried and comprises substantially pure gold metal.

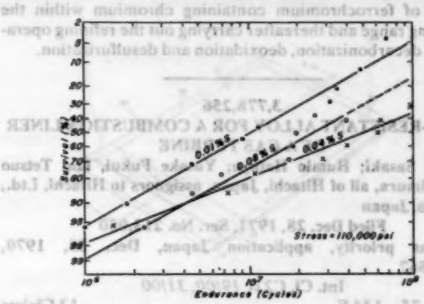
3,778,253

ULTRA-HIGH STRENGTH STEEL

Cornelius M. Lyne, Wexford; August Kasak, Bridgeville, and William Stasko, Munhall, all of Pa., assignors to Crucible Steel Company of America, Pittsburgh, Pa.

Filed Sept. 11, 1967, Ser. No. 666,850
Int. Cl. C22c *37/00*, *39/00*
U.S. Cl. 75—123 R 8 Claims

The present invention relates generally to ultra-high strength steel and, in more particular aspects, relates to an ultra-high strength steel that is characterized by improved fatigue life resulting from the addition of sulfur to the steel in a significant amount. It has been found that fatigue life of ultra-high strength steel may be improved by the addition of at least about 0.04 percent sulfur, preferably 0.04 to 0.25 percent and most advantageously from 0.04 to 0.15 percent sulfur.



3,778,254

BRAZING FILLER METAL FOR MOLYBDENUM

Nancy C. Cole, Knoxville, Tenn.; Ronald W. Gunkel, Kokomo, Ind., and Clarence W. Houck, Lake City, Tenn., assignors to The United States of America as represented by the Atomic Energy Commission, Washington, D.C.

Filed Nov. 18, 1971, Ser. No. 200,235
Int. Cl. C22c *37/00*, *39/00*
U.S. Cl. 75—123 R 1 Claim

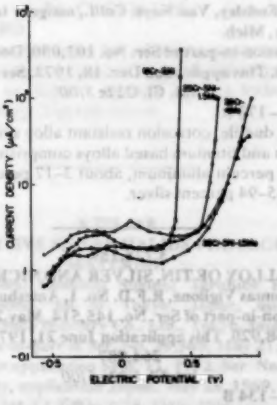
This invention relates to an alloy consisting essentially of, in weight percent, adding up to 100 percent, 0.5 to 4.0 percent boron, 0.5 to 5.0 percent carbon, 15 to 30 percent molybdenum, and the balance iron. Germanium, in a range of 2 to 20 weight percent, may be added to this alloy for improved characteristics in some applications.

3,778,255

CORROSION RESISTANT LOW CARBON CHROMIUM ALLOY STEEL

Tohei Ototani, Sendai; Saburo Shimodaira, Izumi, and Yasuzi Kataura, Sendai, all of Japan, assignors to The Research Institute For Iron, Steel and Other Metals of the Tohoku University, Sendai-shi, Japan

Filed July 25, 1972, Ser. No. 275,072
Claims priority, application Japan, Apr. 5, 1972, 47/33437
Int. Cl. C22c *39/14*, *39/20*
U.S. Cl. 75—126 C 3 Claims



A chromium-containing steel having excellent corrosion resistance whose content of calcium is 0.0005 – 0.02 weight per-

cent, content of carbon is not more than 0.02 weight percent and content of chromium is 25 – 38 weight percent. Such a steel can be produced by adding calcium or an alloy thereof to a melt of ferrochromium containing chromium within the foregoing range and thereafter carrying out the refining operations of decarbonization, deoxidation and desulfurization.

3,778,256

HEAT-RESISTANT ALLOY FOR A COMBUSTION LINER OF A GAS TURBINE

Ryoichi Sasaki; Humio Hataya; Yutake Fukui, and Tetsuo Kashimura, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 28, 1971, Ser. No. 213,050

Claims priority, application Japan, Dec. 28, 1970, 45/119867

Int. Cl. C22c *19/00, 31/00*

U.S. Cl. 75—134 F 13 Claims

An alloy for a combustion liner of a gas turbine, characterized by comprising 0.03 to 0.10 weight percent of carbon, 0.3 to 1.0 weight percent of silicon, 0.50 to 3.00 weight percent of manganese, 43.0 to 50.0 weight percent of nickel, 22.0 to 30.0 weight percent of chromium, 0.10 to 0.50 weight percent of titanium, at least one of 0.005 to 0.20 weight percent of elements of cerium group in rare earth elements and 0.20 to 0.90 weight percent of niobium, and the balance iron and impurities accompanying thereto.

3,778,257

LIGHT-DUTY ELECTRICAL CONTACTS OF SILVER AND RUTHENIUM OXIDE

Terrence Ardern Davies, Horton, England, assignor to Square D Company, Park Ridge, Ill.

Filed Oct. 21, 1971, Ser. No. 191,564

Claims priority, application Great Britain, Oct. 21, 1970, 49,660/70

Int. Cl. C22c *5/00*

U.S. Cl. 75—173 A 2 Claims

A light-duty electrical contact material which consists of a mixture of silver and ruthenium oxide, the ruthenium oxide contact being in the range 0.1 to 13.0 atomic per cent. For reasons of economy, the preferred ruthenium oxide content is 1.3%. The material is produced by powder metallurgical techniques from fine, irregular silver powder and preferably ultra fine ruthenium metal powder. Fine ruthenium oxide powder can be utilized in place of the ruthenium metal powder.

3,778,258

TITANIUM BRAZING ALLOY

Richard A. Endsley, Van Nuys, Calif., assignor to Alloy Metals, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 102,080, Dec. 28, 1970, abandoned. This application Dec. 18, 1972, Ser. No. 316,174

Int. Cl. C22c *5/00*

U.S. Cl. 75—173 R 2 Claims

A strong, ductile, corrosion resistant alloy suitable for brazing titanium and titanium based alloys comprising a mixture of about 3–30 percent aluminum, about 3–17 percent palladium and about 55–94 percent silver.

3,778,259

ALLOY OF TIN, SILVER AND NICKEL

Gaetano Thomas Viglione, R.F.D. No. 1, Amesbury, Mass.

Continuation-in-part of Ser. No. 145,514, May 20, 1971, Pat. No. 3,738,920. This application June 21, 1972, Ser. No. 264,887

Int. Cl. C22c *5/00*

U.S. Cl. 75—134 B 5 Claims

An alloy of tin, silver, balance nickel and impurities is contemplated. The alloy in proportions is tin, 1 to 45 percent, preferably 20 to 45 percent, silver, 45 to 98 percent, balance, nickel and impurities.

3,778,260

SUPERCONDUCTING MATERIALS

Ushio Kawabe; Mitsuhiro Kudo, both of Tokyo; Masato Ishibashi, and Shigeo Fukase, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sept. 9, 1971, Ser. No. 178,925

Claims priority, application Japan, Sept. 9, 1970, 45/78421

Int. Cl. C22c *27/00*

U.S. Cl. 75—174 8 Claims

Intermetallic compound superconducting materials having a stable β-W type crystal structure represented by a general formula of A_3B brought into their closest packed structure and having high critical temperatures in which a part of the atoms either in the A-sites or in the B-sites are replaced by the atoms of a tetra-, penta- or hexa-valent transition metal so that the ratio between the average atomic radius of the atoms in the A-sites and that of the atoms in the B-sites lies close to 1.

3,778,261

MANUFACTURING COMPOSITE ARTICLES

Michael George Nicholas, Wantage, and Iain MacPahil, Reading, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed May 3, 1971, Ser. No. 139,837

Claims priority, application Great Britain, May 4, 1970, 21,460/70

Int. Cl. C22c *29/00*; B22f *1/00, 3/00*

U.S. Cl. 75—204 8 Claims

A method of manufacturing a composite article comprises forming a metal matrix which includes a suitable carbide forming constituent contacting the matrix with a carbonaceous material to be incorporated in the matrix, and heating the matrix to a predetermined temperature below the melting point of the matrix for a sufficient length of time to induce the carbide forming constituent to diffuse through the matrix to the interface between the carbonaceous material and the matrix and react with the carbonaceous material to form a bonding carbide layer between the matrix and the carbonaceous material.

3,778,262

IMPROVED ELECTROPHOTOGRAPHIC PROCESS

Carl A. Queener; William G. Ralston; Thomas C. Smith, and Joseph P. Welsh, all of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1971, Ser. No. 110,756

Int. Cl. G03g *13/08*

U.S. Cl. 96—1 R 6 Claims

This is an electrophotographic process comprising the step of contacting a latent electrostatic image with a developer comprising carrier and toner. The carrier is a core coated with a continuous film of a fluoropolymer and a modifying resin. This carrier has a positive triboelectric charge with respect to the toner. This positive charge is obtained by curing the coated carrier at a temperature less than 700°F.

3,778,263

ZINC OXIDE PHOTOCONDUCTIVE ELEMENT WITH STARCH REACTION PRODUCT INTERLAYER

Fumiaki Arai, Tokyo; Wasaburo Ohta; Junji Kurokawa, both of Yokohama; Noriyuki Usui, Kawasaki; Sakae Shimizu, Tokyo, and Tetsuo Tanaka, Kasukabe, all of Japan, assignors to Kabushiki Kaisha Ricoh, Ota-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 830,252, June 4, 1969, Pat. No. 3,682,632. This application June 19, 1972, Ser. No. 264,385

Claims priority, application Japan, June 14, 1968, 43/40585; Sept. 9, 1968, 43/64277; Oct. 2, 1968, 43/71153; Oct. 12, 1968, 43/74449; Oct. 9, 1968, 43/73174

Int. Cl. G03g *5/04, 5/08*

U.S. Cl. 96—1.8 2 Claims

An electrophotographic copying material having a photoconductive layer formed on the surface of a support, whose back is pre-coated with an electroconductive layer, with an intermediary layer between said photoconductive layer and the support, said intermediary layer comprising a printing-durable polymer consisting of methylol starch or a mixture of methylol starch and vinyl polymer.

3,778,264

ZINC OXIDE PHOTOCONDUCTIVE ELEMENT WITH AN EPOXY GROUP CONTAINING INTERLAYER

Fumiaki Arai, Tokyo; Wasaburo Ohta; Junji Kurokawa, both of Yokohama; Noriyuki Usui, Kawasaki; Sakae Shimizu, Tokyo, and Tetsuo Tanaka, Kasukabe, all of Japan, assignors to Kabushiki Kaisha Richo, Ota-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 830,252, June 4, 1969, Pat. No. 3,682,632. This application June 26, 1972, Ser. No. 266,146

Int. Cl. G03g *5/04, 5/08*

U.S. Cl. 96—1.8 2 Claims

An electrophotographic copying material having a photoconductive layer formed on the surface of a support, whose back is pre-coated with an electroconductive layer, with an intermediary layer between said photoconductive layer and the support, said intermediary layer comprising a printing-durable polymer consisting of the reaction product of (A) a polymer having epoxy groups and (B) at least one member selected from the bridge-making agent group consisting of water-soluble amino resin, amino compound, dibasic acid and acid anhydride.

3,778,265

NOVEL PHOTOGRAPHIC PRODUCTS AND PROCESSES

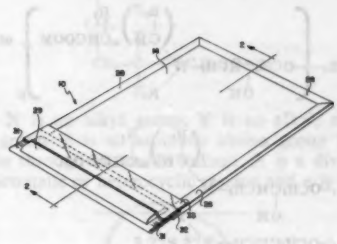
Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. Nos. 65,084, Aug. 19, 1970, Pat. No. 3,672,890, and Ser. No. 782,075, Dec. 9, 1968, Pat. No. 3,573,043, and Ser. No. 846,442, July 31, 1969, Pat. No. 3,576,625, and Ser. No. 782,056, Dec. 9, 1968, Pat. No. 3,573,043, which is a continuation-in-part of Ser. No. 622,283, March 10, 1967, Pat. No. 3,415,644. This application June 13, 1972, Ser. No. 262,332

Int. Cl. G03c *7/00*

U.S. Cl. 96—3 45 Claims

The present invention relates to photography and, more particularly, to diffusion transfer process photographic film units which comprise a photosensitive element adapted to provide, by diffusion transfer photographic processing, selective dye image recordation of incident actinic radiation as a function of the point-to-point degree of photosensitive element exposure, which film unit includes a plurality of essential layers including a photosensitive silver halide layer having associated therewith diffusion transfer process dye image-forming material, a layer adapted to receive dye image-forming material diffusing thereto which is a substantially continuous polymeric layer comprising, in essence, a neutral polymer adapted to interact with an aqueous alkaline processing composition in contact with the layer to reduce the alkalinity thereof and to thereby increase the stability of a dye transfer image carried by such layer, and a mordant associated with



the layer adapted to mordant dye image-forming material diffusing to the layer; and to specified diffusion transfer processes employing such film units.

3,778,266

METHOD OF FORMING A BLACK PATTERNED PORTION ON A PHOSPHOR SCREEN OF A CATHODE-RAY TUBE FOR COLOR TELEVISION SETS

Hideaki Mizuno, Tokyo; Toshio Konno, Yokohama, and Naoki Akiyama, Yurigaoka, all of Japan, assignors to Victor Company of Japan, Limited, Kanagawa-ku, Yokohama, Japan

Filed July 29, 1970, Ser. No. 59,301

Claims priority, application Japan, July 31, 1969, 44/60574

Int. Cl. G03c *5/00*

U.S. Cl. 96—36.1 12 Claims

A method of forming a black patterned portion on the inner surface of a face plate of a panel section of a cathode-ray tube for color television sets. The black patterned portion is formed in gaps between the phosphor dots to be formed on the inner surface of a face plate by deposition of a black patterned portion forming composition by vaporization.

3,778,267

PHOTOGRAPHIC DEVELOPER

Simeon Braunstein, Malden, Mass., assignor to The United States of America as represented by the Secretary of the United States Air Force, Washington, D.C.

Filed Oct. 14, 1971, Ser. No. 189,327

Int. Cl. G03c *5/30*

U.S. Cl. 96—66 HD 1 Claim

A photographic developer for achieving maximum film sensitivity by increasing the dynamic range of a photographic film which includes an additive mixture of N-(p-hydroxyphenyl glycin) and 1-phenyl-3-pyrazolidone.

3,778,268

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Rintaro Ushiyama; Osakazu Sugino; Teruhide Haga, and Koichi Horigome, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 39,568, May 21, 1970, abandoned. This application Sept. 11, 1972, Ser. No. 288,160

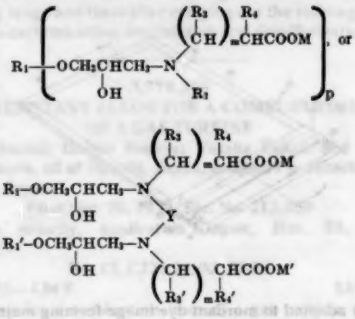
Claims priority, application Japan, May 28, 1969, 44/40991

Int. Cl. G03c *1/38, 1/40, 1/04*

U.S. Cl. 96—74 4 Claims

A light-sensitive silver halide photographic material con-

taining as anti-spotting agent, at least one compound represented by the general formula



3,778,269

METHOD FOR USE OF INORGANIC AZIDES AS PHOTOSENSITIVE MATERIALS AT LOW TEMPERATURES

Donald A. Wiegand, Landing, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 19, 1971, Ser. No. 200,616
Int. Cl. G03c 5/00, 5/16, 5/18
U.S. Cl. 96—27 R 4 Claims

A new method is provided for the production of permanent photographic images at low temperatures by the use of heavy metal azides such as thallium, lead and silver azide as the photosensitive material in the photographic process.

3,778,270

PHOTOSENSITIVE BIS-DIAZONIUM SALT COMPOSITIONS AND ELEMENTS

Leo Roos, New Shrewsbury, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 833,774, June 16, 1969, abandoned. This application Nov. 12, 1970, Ser. No. 89,133
Int. Cl. 96 36.3; G03f 7/08; G03c 1/54
U.S. Cl. 96—75 10 Claims

A crosslinkable-photosensitive composition which comprises a bis-diazonium salt with a natural or synthetic macromolecular organic polymer having pendant reactive groups. The compositions are useful in elements for the preparation of relief images, photo-resist applications, etc.

3,778,271

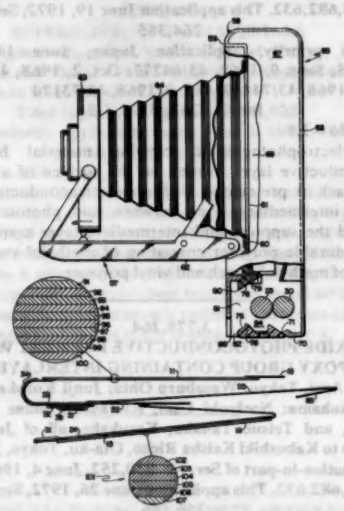
PHOTOGRAPHIC PRODUCTS COMPRISING AN OPACIFYING AGENT IN ASSOCIATION WITH A REFLECTING AGENT

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 22, 1971, Ser. No. 191,941
Int. Cl. G03c 1/48, 5/54, 7/00
U.S. Cl. 96—77 15 Claims

Film assemblies in the nature of a self-developing film which comprise a photosensitive element including an opaque support carrying photosensitive silver halide having associated diffusion transfer process dye image-providing material; an image-receiving element including a transparent support carrying a diffusion transfer image-receiving layer and a reflecting layer; rupturable container means retaining a fluid processing composition for distribution between the photosensitive and the image-receiving elements; and including opacifying agent disposed in the fluid processing composition and/or integral with or as a layer on the surface of the image receiving element's reflecting layer opposite the transparent support, for processing external a camera in which the film assembly is exposed and adapted to provide a color reflection print as a function of the film unit's photoexposure.

Subsequent to exposure, the film unit is specifically adapted to be withdrawn from the camera between pressure-applying members which effect release of the fluid processing composition for production of the dye transfer image. During and subsequent to processing, formation of the color reflection print may be viewed through the image-receiving element's transparent support against the background provided by the element's reflection layer and the reflection layer, taken together with the opacifying agent, is specifically adapted to protect the photosensitive silver halide from exposure during processing in the presence of radiation incident on the viewing surface.



3,778,272

PHOTOGRAPHIC TRANSFER MATERIALS

Martin Hepher, Berkhampstead, England, assignor to Norprint Limited, London, England

Filed Aug. 16, 1971, Ser. No. 172,254
Claims priority, application Great Britain, Aug. 17, 1970, 39,493/70
Int. Cl. G03c 1/78
U.S. Cl. 96—87 R 8 Claims

Photographic transfer materials are described incorporating adhesive substratum layers which are used in order to transfer the photosensitive layer from the transfer layer to another surface. An intermediate substratum layer comprising a polyamide soluble in a mixture of an alcohol and water is used. The photosensitive layer is preferably based on a water-soluble colloid or polymeric material.

3,778,273

PHOTOGRAPHIC MATERIAL

Herbert Gernert, Munich; Hans Glockner, Pullach; Ernst Meier, Munich; Hans Ohlschlager, Cologne, and Oskar Riester, Leverkusen, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 28, 1972, Ser. No. 267,168
Claims priority, application Germany, June 30, 1971, P 21 32 393.3
Int. Cl. G03c 1/89
U.S. Cl. 96—84 R 6 Claims

Antihalation layers or filter layers for photographic materials containing a combination of the following dyes: (1) Condensation products of alkoxyaldehydes with pyrazolones in

which the dye molecule contains an acid group, a diffusion-preventing radical and in addition an alkoxy substituted phenyl ring, (II) tri- or pentamethine oxonoles of alkyl substituted thiobarbituric acids preferably in form of their silver salt and (III) color lakes of aurin tricarboxylic acid. Said antihalation layers or filter layers absorb predominantly in the blue and green region of the spectrum and can be decolorized as completely as possible even if a filter is processed automatically in a roll development machine with a very rapid throughput.

3,778,274

SPECTRALLY SENSITIZED DIAZO MATERIAL

Eiichi Inoue, and Toshihiro Yamase, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1971, Ser. No. 132,074
Claims priority, application Japan, Apr. 8, 1970, 45/29875
Int. Cl. G03c *1/60*; G03f *7/08*
U.S. Cl. 96—91 R 4 Claims

A dithiocarbamate is mixed with a photolytic aromatic diazo compound to improve the intrinsic sensitivity and spectral sensitivity of the photosensitive material for diazo photography.

3,778,275

SEDIMENTATION PROCESS FOR FLOCCULATED DISPERSIONS

Edward G. Denk, Waltham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

No Drawing. Filed Dec. 28, 1971, Ser. No. 213,100
Int. Cl. G03c *1/02*
U.S. Cl. 96—94 13 Claims

The rate of sedimentation of floccules from dispersion may be accelerated by introducing in said dispersion a small amount of insoluble particles. Each of these particles adsorbs onto the protective colloid layer of more than one floccule and through a "bridging" mechanism acts to hold those floccules together in aggregates which precipitate at a rate much faster than the floccules individually. The process of this invention is particularly useful during the washing steps of photographic silver halide emulsion preparations employing flocculation methods.

3,778,276

PHOTOGRAPHIC ELEMENT COMPRISING A GELATIN AQUEOUS COMPOSITION CONTAINING A HALOMETHYL KETONE OF BENZYLOXYCARBONYL PHENYLALANINE

Elliott N. Shaw, Shoreham, N.Y., assignor to Polaroid Corporation, Cambridge, Mass.

No Drawing. Filed May 22, 1972, Ser. No. 255,709
Int. Cl. G03c *1/02*; A23l *3/34*
U.S. Cl. 96—94 R 7 Claims

Aqueous solutions of gelatin and gelatin-containing layers such as photographic silver halide emulsions containing benzyloxycarbonyl phenylalanine chloromethyl ketone and benzyloxycarbonyl phenylalanine bromomethyl ketone to control enzyme activity and decelerate bacterial growth and reproduction. A phenolic biostat may optionally be added for improved results.

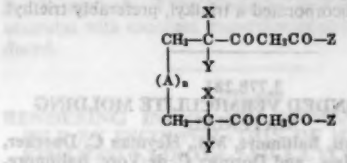
3,778,277

LIGHT-SENSITIVE COLOR PHOTOGRAPHIC MATERIAL WITH BIS-TYPE YELLOW COLOR COUPLER

Mitsuto Fujiwhara, Tamotsu Kozima, Hiroyuki Imamura, and Takaya Endo, Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd.

No Drawing. Filed Aug. 20, 1971, Ser. No. 173,681
Claims priority, application Japan, May 30, 1970, 45/46,030
Int. Cl. G03c *1/40*
U.S. Cl. 96—100 8 Claims

A light-sensitive silver halide color photographic material containing a yellow coupler of the general formula



wherein X is an alkyl group, Y is an alkyl, alkoxy or aralkyl group, Z is an aromatic amino group linked to the chain through an amide linkage. A is a divalent aliphatic, aromatic or heterocyclic residue and *n* is 0 or 1.

3,778,278

PHOTOGRAPHIC GELATINO-SILVER HALIDE EMULSIONS CONTAINING HYDROLYZED MODIFIED GELATIN, AND A PROCESS FOR THEIR MANUFACTURE

Bohdan Rakoczy, East Brunswick, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 49,167, June 23, 1970. This application Apr. 26, 1972, Ser. No. 247,521
Int. Cl. G03c *1/72*
U.S. Cl. 96—114.8 20 Claims

A method for increasing the covering power of a gelatino-silver halide emulsion without producing deleterious haze comprising the substitution of about 15–35% of the total gelatin binder of the emulsion with a gelatin reaction product which has first been hydrolyzed in an aqueous solution of a strong acid (pH 0.1 to 1.0) or a strong base (pH 10.5–13.5) and further modified by reaction of the product from said hydrolysis with a dibasic acid anhydride. The dibasic acid anhydride may comprise an aliphatic, aromatic, cycloalkyl, cyclo-olefinic or heterocyclic structure having the anhydride group attached thereto. The hydrolyzed and modified gelatin may be added as the binder supplement during the preparation of the emulsion or admixed after said preparation. Alternatively, the hydrolyzed, modified gelatin may be incorporated into a layer contiguous to the silver bearing stratum.

3,778,279

SENSITISATION OF PHOTOGRAPHIC SILVER HALIDE LAYERS FOR THE SILVER DYE BLEACH PROCESS

Johannes Göte, Bergisch Neukirchen, and Erich Böckly and Oskar Riester, Leverkusen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed July 14, 1971, Ser. No. 162,665
Claims priority, application Germany, July 18, 1970, P 20 35 727.1
Int. Cl. G03c *1/08*
U.S. Cl. 96—140 8 Claims

The spectral sensitivity of silver halide emulsions for the silver dye bleach process is increased by addition of urea substituted merocyanines of the formula defined below.

3,778,280

PAINTS AND COATINGS

Werner Dittrich, Herten, Baden, Germany, assignor to Dynamit Nobel AG, Troisdorf, Germany

No Drawing. Continuation of abandoned application Ser. No. 101,136, Dec. 23, 1970. This application June 30, 1972, Ser. No. 267,821
Claims priority, application Germany, Jan. 3, 1970, P 20 00 199.4
Int. Cl. C09d *5/10*
U.S. Cl. 106—1 7 Claims

Galvanic action coating material having improved properties comprising a pigment, such as zinc dust, lithopone, iron oxides, titanium dioxide or cadmium sulfide,

and a bonding agent comprising an alkyl silicate in which there has been incorporated a trialkyl, preferably triethyl, phosphate.

3,778,281

FUSION BONDED VERMICULITE MOLDING MATERIAL

Patrick M. Brown, Baltimore, Md., Heyman C. Duecker, Cambridge, Mass., and Dorothy C. de Vore, Baltimore, Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Dec. 16, 1971, Ser. No. 208,601
Int. Cl. C04b *33/00*
U.S. Cl. 106—67 **11 Claims**

Fusion bonded vermiculite molding material prepared from vermiculite, sodium borate, sodium metaphosphate and clay is used to prepare a variety of materials and structures including, among others, a strong, lightweight decorative fire resistant board, a superior foundry mold and a lightweight synthetic aggregate.

3,778,282

PIGMENTARY COMPOSITIONS, THEIR PREPARATION AND THEIR APPLICATIONS TO THE COLOURATION IN BULK OF CELLULOSE ESTERS

Francis Rene Daniel Manier, Villemomble, France, assignor to Ugine Kuhlmann, Paris, France

No Drawing. Filed Mar. 23, 1971, Ser. No. 127,400
Claims priority, application France, Mar. 25, 1970, 7010704
Int. Cl. C08b *21/04, 27/28, 27/38*
U.S. Cl. 106—187 **15 Claims**

Pigmentary composition comprising:

(a) at least one colouring matter insoluble in water and in the organic solvents used for spinning fibres based on cellulosic esters,

(b) a non-ionic surface-active substance insoluble in water, but soluble in the organic solvents used for spinning fibres based on cellulosic esters, in an amount B of between 1% and 10% inclusive, of the weight (A) of the colouring matter, and

(c) A cellulosic ester in an amount C such that the ratio

$$\frac{A\times 100}{A+B+C}$$

is between 20 and 95 inclusive.

The pigmentary composition may be prepared by a process wherein (a) On the one hand zinc chloride, and on the other hand a cellulosic ester, are introduced into an aqueous dispersion of the water-insoluble colouring matter and the non-ionic surface-active substance, the amounts of colouring matter (A), water (A'), non-ionic surface-active substance (B), cellulosic ester (C) and zinc chloride (D) used being such that the following relations are satisfied:

$$20\leqslant\frac{A\times 100}{A+B+C}\leqslant 95$$

$$\frac{A}{00}\leq B\leqslant\frac{A}{10}$$

$$55\leqslant\frac{D\times 100}{A'+D}\leqslant 70$$

then (b) the mixture is diluted with water until the ratio:

$$\frac{\text{Weight of zinc chloride}}{\text{Weight of water}+\text{weight of zinc chloride}}$$

becomes equal to or less than 0.4, and (c) the precipitate thus obtained is isolated. The pigmentary composition is useful for the colouration of bulk cellulosic esters.

The present invention concerns pigmentary compositions, their preparation and their applications to the colouration in bulk of cellulosic esters.

3,778,283

BINDERS BASED ON ALKALI METAL SILICATES

Helmut von Freyhold, Dusseldorf-Oberkassel, Germany, assignor to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

No Drawing. Filed Feb. 28, 1972, Ser. No. 230,084
Claims priority, application Germany, Mar. 3, 1971, P 21 10 059.4
Int. Cl. C09d *1/04*
U.S. Cl. 106—84 **6 Claims**

Binders based on aqueous alkali metal silicate solutions comprise an admixture of triglycidylisocyanurate with an epoxide content over 14% by weight, in amounts from 0.03 to 2.0% by weight, based on the solid content of the alkali metal silicate solution; water-soluble amines which contain at least 2 active hydrogen atoms, bound to nitrogen, in amounts from 0.1 to 5% by weight, based on the solid content of the alkali metal silicate solution; and water-soluble quaternary and/or polyquaternary nitrogen compounds in amounts from 0.1 to 5% by weight, based on the solid content of the alkali metal silicate solution.

3,778,284

METHOD OF MANUFACTURING A BINDER IN A VARNISH FOR VARNISHING ELECTROPLATES

Carl-Artur Akerblom, Surahammar, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

No Drawing. Filed Dec. 16, 1971, Ser. No. 208,883
Claims priority, application Sweden, Dec. 21, 1970, 17,261/70
Int. Cl. C08b *25/00*
U.S. Cl. 106—162 **10 Claims**

Electrical steel sheet is varnished with a varnish produced by oxidizing a carbohydrate so that carboxyl groups are formed in the molecule and adding furfural to the oxidized carbohydrate.

3,778,285

HIGH K DIELECTRIC PRINTING PASTES

Daniel W. Mason, West Peabody, Mass., assignor to Owens-Illinois, Inc.

No Drawing. Application Jan. 18, 1971, Ser. No. 107,566, now Patent No. 3,679,440, dated July 25, 1972, which is a continuation-in-part of abandoned application Ser. No. 54,591, July 13, 1970. Divided and this application Jan. 27, 1972, Ser. No. 221,426
Int. Cl. C08b *27/42, 27/04*
U.S. Cl. 106—179 **14 Claims**

Unique dielectric compositions may be used to formulate thick film pastes for printing microelectronic capacitors. The resulting dielectrics exhibit dielectric constants greater than about 500 and capacitances greater than about 80,000 picofarads per square inch at a thickness of at least about 1.0 mil. The unique dielectric compositions comprise about 55–76 percent by weight of a ferroelectric material and 45–24 percent of a glass binder. The glass binder employed comprises a lead barium borosilicate glass and a ferroelectric material previously dissolved therein. The composition is formulated into a printing paste by first dissolving 20–30 percent by weight ferroelectric into 70–80 percent by weight lead barium borosilicate glass binder, cooling the newly formed glass to a solid state, comminuting the glass to a particle size of less than about 1 micron and thereafter admixing the comminuted glass with the same particulate ferroelectric in an amount as indicated. This admixture is then added to a liquid organic carrier vehicle to formulate the printing paste. The printing paste is then printed into

a chosen design and fired at a temperature of approximately 1,000–1,050° C. to produce a highly dense, uniform, and substantially crack-free dielectric material.

3,778,286
PROTECTION OF RUBBER SURFACES FROM OXIDATION EFFECTS
Stavros A. Kyriakides, 9215 Hillview Drive, Clarence, N.Y. 14031
No Drawing. Continuation-in-part of application Ser. No. 39,900, May 21, 1971. This application Jan. 3, 1972, Ser. No. 215,102
Int. Cl. C08c *17/24*
U.S. Cl. 106—287 R **12 Claims**

Synthetic and natural rubber vulcanizates are stabilized and protected against the effects of weather deterioration and ozone attack (surface cracking) by chemically treating the surface of rubber products with a composition comprising an alkyl substituted paraphenylene diamine, a wetting agent, such as an alkyl arylsulfonate, a terpene liquid, and a volatile solvent carrier. The composition is designed for migrating beneath the surface of the rubber vulcanizate, thereby assuring complete use and effectiveness of the antiozonant, and the protective coating is not impaired by flexing or scuffing.

3,778,287
PIGMENT DISPERSIONS
James Frederick Stansfield and Arthur Topham, Manchester, England, assignors to Imperial Chemical Industries Limited, Millbank, London, England
No Drawing. Filed Dec. 2, 1971, Ser. No. 204,328
Claims priority, application Great Britain, Dec. 22, 1970, 60,903/70; June 14, 1971, 27,768/71
Int. Cl. C09c *3/02*
U.S. Cl. 106—308 Q **8 Claims**

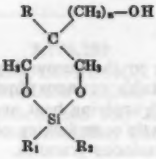
Dispersions of inorganic pigments or lakes or toners in organic liquids which contain dissolved therein one or more polyesters or a salt thereof derived from a hydroxycarboxylic acid of the formula: HO—X—COOH wherein X is a divalent saturated or unsaturated aliphatic radical containing at least 8 carbon atoms and in which there are at least 4 carbon atoms between the hydroxy and carboxylic acid groups, or from a mixture of such a hydroxycarboxylic acid and a carboxylic acid which is free from hydroxy groups. The dispersions are finely divided and well deflocculated, and are valuable in the manufacture of inks and paints.

3,778,288
METHODS FOR PREPARING MASTER BATCHES OF ADDITIVE CONCENTRATES
Alvin Arthur Ridge and Jack Marquis Polchet, Sasolburg, Republic of South Africa, assignors to South African Coal, Oil and Gas Corporation Limited, Sasolburg, Republic of South Africa
Filed Nov. 15, 1971, Ser. No. 198,814
Int. Cl. C08h *17/04*
U.S. Cl. 106—308 Q **6 Claims**

High melt point waxes or their derivatives are intermixed with pigments or other additive compositions in "high speed" mixers of the Henschel type, for example, to form "master batches" of additive concentrates and color concentrates for addition to plastics and/or polymers, resins, waxes, wax-resin mixtures and the like. Mixing temperatures are elevated above room temperature for predetermined mixing times. During mixing, the waxes or wax derivatives soften and coat the additive particles. Concentrate particles are thus formed whose average particle size increases unexpectedly with mixing time, apparently by the operation of a "progressive agglomeration" phenomenon, until the optimum concentrate particle-size is produced. Subsequent size reduction by grinding techniques are partly or wholly eliminated by the methods of the invention, and high quality concentrates with excellent dispersion characteristics are produced.

3,778,289
RENDERING INORGANIC PIGMENTS DISPERSIBLE BY INCORPORATION OF HYDROXY-SUBSTITUTED 1,3-DIOXA-2-SILA-CYCLOHEXANES
August Böckmann, Krefeld-Bockum, Gerhard Trenczek, Krefeld-Uerdingen, Hans Rudolf, Krefeld-Bockum, Wolfgang Wiegreffe, Krefeld, and Wolfgang Ritter, Dusseldorf, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Mar. 14, 1972, Ser. No. 234,665
Claims priority, application Germany, Mar. 19, 1971, P 21 13 297.8
Int. Cl. C08j *1/36*
U.S. Cl. 106—308 Q **10 Claims**

Inorganic pigments such as titanium dioxide are rendered easily dispersible in aqueous or non-aqueous systems by the presence of about 0.1 to 5% by weight of hydroxy-substituted 1,3-dioxa - 2 - sila-cyclohexanes, preferably of the formula



(I)

wherein

R is hydrogen, alkyl, alkoxyalkyl or aryl,
R_1 and R_2 each independently is alkyl, and
n is 0 or 1,

the alkyl radicals of R, R_1 and R_2 each containing up to about 6 carbon atoms.

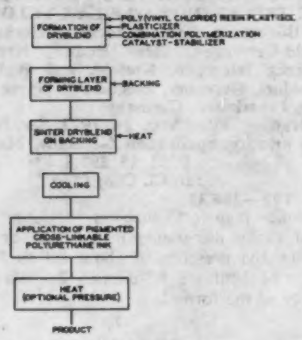
3,778,290
DECORATIVE FLOORING SURFACES
Herbert Jackson Shearing, Manchester, England, assignor to Imperial Chemical Industries Limited, Millbank, London, England
No Drawing. Filed Mar. 11, 1971, Ser. No. 123,420
Claims priority, application Great Britain, Mar. 18, 1970, 13,041/70; Aug. 11, 1970, 38,631/70; Dec. 24, 1970, 61,328/70
Int. Cl. B44c *1/22;* **C04b** *7/02*
U.S. Cl. 117—8 **11 Claims**

A process for the manufacture of decorative flooring surfaces which comprises applying to the floor to be surfaced a composition having as essential ingredients a hydraulic cement, a filler in the form of fragments or coarse particles, water and an organic polyisocyanate, allowing the composition to harden and then grinding or otherwise-treating the surface of the composition to expose the fragments or particles of filler. The filler may be, for example, fragments of plastic material, glass or stone, or stone aggregate. The compositions set rapidly and the final surface is very durable.

3,778,291
PROCESS FOR PRODUCING A DECORATIVE SURFACE COVERING
Charles G. Elliott, Landisville, and Richard P. Mazzur, Millersville, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.
Filed Feb. 11, 1972, Ser. No. 225,447
Int. Cl. D06n *7/04;* **E04f** *15/10*
U.S. Cl. 117—21 **8 Claims**

A process for producing a flexible resinous composition surface covering by preparing a granular resinous dry-

blend containing a catalyst adapted to cure a noncatalyst-containing resinous system different from that of the dry-blend, comprising depositing a layer of the catalyst-containing dryblend on a backing sheet, heating the granules to form a porous cohesive layer therefrom, cooling the



layer and applying to the porous layer a different, non-catalyzed cross-linkable resinous liquid which will penetrate thereinto, and applying heat and/or heat and pressure to cause catalytic cross-linking of the resinous liquid and fusion of the resinous granules.

3,778,292

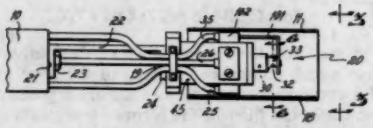
METHOD OF STRIPING THE INSIDE SEAMS OF CANS

Alvin A. Rood, Westlake, and Edwin F. Hogstrom and William C. Stumphauzer, Sheffield Lake, Ohio, assignors to Nordson Corporation, Amherst, Ohio

Original application Jan. 19, 1971, Ser. No. 107,632, now Patent No. 3,702,107. Divided and this application Mar. 9, 1972, Ser. No. 233,228

Int. Cl. B05c *7/02*

U.S. Cl. 117—43 **3 Claims**



A method and apparatus for applying an impervious protective coating over the seams of cylindrical metal can bodies either before or after the seams are welded, soldered, or cemented and prior to spray coating the complete interior of the bodies. The apparatus is operable to intermittently apply an airless spray to the interior seams of the cans as they continuously move past an airless spray gun secured to the end of a stubhorn of a can forming line. The apparatus includes a new and improved airless spray nozzle which is operable to atomize the spray nearer the nozzle than has heretofore been possible. It also includes a pair of air jets located on opposite sides of the spray and operable to confine the atomized spray or fog to the seam of the can so that little or no excess material is sprayed onto that portion of the can located adjacent the seam.

ERRATUM

For Class 117—68 see:
Patent No. 3,778,251

3,778,293

METHOD OF MAKING REGENERATIVE HEAT-EXCHANGER SEALS

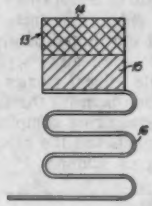
Calvin Eric Silverstone, Alcester, England, assignor to British Leyland Truck and Bus Division Limited, Leyland, Lancashire, England

Filed July 17, 1972, Ser. No. 272,398

Claims priority, application Great Britain, Sept. 30, 1971, 45,513/71

Int. Cl. B05b *5/06*; F28d *19/00*

U.S. Cl. 117—93.1 PF **4 Claims**



A method of manufacturing a counterface cold-side seal for a rotary disc-type matrix of a regenerative heat-exchanger comprises: forming a mixture of a temperature-resistant polymer and a solid lubricant, and depositing this mixture onto a counterface support pad of the seal by means of flame or plasma spraying.

3,778,294

PRODUCTION OF POLYMERS WITH A FIBROUS STRUCTURE

Carl Heinrich Krauch, Heidelberg, and Axel Sanner, Ludwigshafen (Rhine), Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Original application July 16, 1968, Ser. No. 745,113. Divided and this application Sept. 22, 1971, Ser. No. 182,860

Claims priority, application Germany, July 22, 1967, P 17 20 286.7; Feb. 24, 1968, P 17 20 350.8; May 30, 1968, P 17 70 528.1, P 17 70 529.2; May 31, 1968, P 17 70 543.0; June 1, 1968, P 17 70 552.1

Int. Cl. B44d *1/50*; D06m *13/20*

U.S. Cl. 117—93.31 **11 Claims**

Polymers having a fibrous structure are obtained by the polymerization of solutions and/or emulsions or dispersions fully or partially solidified in crystalline form, of ethylenically unsaturated monomers with at least two polymerizable double bonds or mixtures containing at least 0.01% by weight of these monomers and monoethylenically unsaturated monomers by irradiation, which polymers can be obtained in the form of novel porous materials (=poromeric materials) having properties similar to leather.

3,778,295

CHEMICAL PLATING METHOD OF PREPARING RADIATION SOURCE MATERIAL

Paul K. Smith and Richard T. Huntoon, Aiken, and Wilbur C. Mosley, Jr., New Ellenton, S.C., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Mar. 8, 1972, Ser. No. 232,933

Int. Cl. B44d *1/02*

U.S. Cl. 117—100 B **5 Claims**

A uniform dispersion of a radioisotope within a noble metal matrix is provided by chemically plating a noble

metal coating onto particles including a dissociable compound of the radioisotope. A suspension of the dissociable compound in a chemically reductive solution is prepared and noble metal cations added to produce the noble metal coatings. The coated particles are filtered, dried and heated to calcine the dissociable compound to a refractory powder. The powder can be encapsulated in measured portions or consolidated and shaped into an elongated form for easy apportionment as radiation source material.

3,778,296

PROCESS FOR THE PRODUCTION OF SILICON CARBIDE WHISKERS

Eduard Thalmann, Zug, and Hans-Rudolf Staub, Eggenwil, Switzerland, assignors to Lonza Limited, Gampel, Valais, Switzerland

No Drawing. Filed May 4, 1971, Ser. No. 140,270
Claims priority, application Switzerland, May 14, 1970, 7,191/70
Int. Cl. C23c *13/04*
U.S. Cl. 117—106 C **4 Claims**

The present invention is concerned with a process for the production of silicon carbide whiskers by growing the whiskers at an elevated temperature on a substrate from a gaseous phase containing the whisker components, wherein there is used a substrate to which has been applied a layer comprising at least one crystal growth-promoting material, carbon and a lacquer.

3,778,297

CHROMIZING FERROUS METAL SUBSTRATES

Kenneth Urmston Holker, Harrogate, England, assignor to National Steel Corporation, Pittsburgh, Pa.

No Drawing. Filed Jan. 3, 1972, Ser. No. 215,150
Claims priority, application Great Britain, Jan. 5, 1971, 496/71
Int. Cl. C23c *9/00*
U.S. Cl. 117—107.2 P **20 Claims**

In order to mitigate the formation of a layer of sintered powder on the surface of ferrous substrates chromized by the application of an adhesive layer followed by the application of chromium powder and a heat treatment to bring about the formation of a diffusion alloy surface layer, hydrated magnesium or aluminum halides or magnesium oxyhalide is applied to the substrate before, with or after the chromium. Preferably the halide is applied as an aqueous solution before the chromium so as to form the adhesive layer. pH modifiers may be incorporated to reduce the acidity of the solution in the case where aluminum chloride is used as the halide.

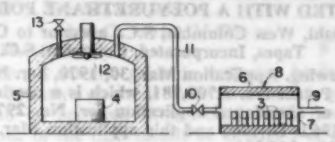
3,778,298

PROCESS OF METALLIC CEMENTATION

Norio Kanetake, Tokyo, and Hiroshi Shirai, Yokohama, Japan, assignors to Kabushiki Kaisha Kito, Kawasaki-shi, Kanagawa-ken, Japan

Filed May 3, 1971, Ser. No. 139,600
Int. Cl. C23c *11/04*
U.S. Cl. 117—107.2 R **5 Claims**

A chromium cementation process comprises heating an object to be cemented along with a porous body of chromium which has absorbed chromium halide in order to effect a chromium cementation of the object. The object to be cemented may be placed in a chamber along with one or more of the agents and both heated together in the chamber which may advantageously be an electric furnace chamber. The object to be cemented with chromium may also be placed in an electric furnace separately and the agent placed in a halide generating apparatus wherein the metal halide fine particles are carried by an unoxidizing gas into the electric furnace into contact with the object to be cemented. A further arrangement is to place the agent in a tank containing neutral salts which is contained in the furnace and then heating the agent along with the object to be cemented which is



also placed in the tank. The apparatus employed may comprise a separate furnace having a halide generating apparatus connected therethrough to a connecting line and with a fan in the furnace for circulating the gas which is directed first to the halide generating apparatus and then through the connecting line into the electric furnace.

3,778,299

ROTARY BARREL DIFFUSION COATING IN MOLTEN LEAD

John J. Rausch, Antioch, and Ray J. Van Thyne, Oak Lawn, Ill., assignors to Surfalloy Corporation, Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 768,187, Oct. 16, 1968, now Patent No. 3,620,816. This application Nov. 12, 1971, Ser. No. 198,404
Int. Cl. C23c *9/00*
U.S. Cl. 117—109 **3 Claims**

A novel process for diffusion coating of ferrous articles in a lead bath by sealing all of the constituents in a barrel which is rotated in a non-vertical position at the chromizing temperature. Such processing results in extremely diffused zones on irregularly-shaped parts.

3,778,300

METHOD OF FORMING IMPERMEABLE CARBIDE COATS ON GRAPHITE

Cornel Wohlberg, Los Alamos, N. Mex., assignor to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Oct. 7, 1966, Ser. No. 586,000
Int. Cl. C23f *11/00*
U.S. Cl. 117—118 **8 Claims**

A method of forming an impermeable refractory metal carbide coating on graphite in which a metal containing oxidant and a carbide former are applied to the surface of the graphite, heated to a temperature of between 1200° C. and 1500° C. in an inert gas, and applying a vacuum and continuing to heat to about 2300° C.

3,778,301

METHOD OF COATING GRAPHITE TUBES WITH REFRACTORY METAL CARBIDES

Cornel Wohlberg, Jeanette, Pa., assignor to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Apr. 28, 1967, Ser. No. 636,573
Int. Cl. C23f *11/00*
U.S. Cl. 117—118 **3 Claims**

A method of coating graphite tubes with a refractory metal carbide and in which an alkali halide is reacted

with a metallic oxide, said metallic portion being selected from the IVth or Vth group of the Periodic Table, the resulting salt reacting in turn with the carbon to give the desired refractory metal carbide coating.

3,778,302

CERTAIN PERMEABLE MATERIALS IMPREGNATED WITH A POLYURETHANE POLYMER

Rolf Dahl, West Columbia, S.C., assignor to Continental Tapes, Incorporated, Columbia, S.C.

No Drawing. Application Mar. 30, 1970, Ser. No. 23,983, now Patent No. 3,702,781, which is a continuation-in-part of abandoned application Ser. No. 297,190, July 24, 1963. Divided and this application Mar. 16, 1972, Ser. No. 235,398

Int. Cl. C09j *7/04*

U.S. Cl. 117—122 PB **9 Claims**

Permeable materials containing "active" hydrogen, such as paper, are markedly improved in dry and wet tensile strengths and delamination resistance without loss of flexibility, by impregnation with certain polyurethane polymers.

3,778,303

PROCESS FOR PROTECTING A SUBSTRATE WITH AN ARYLSULFONAMIDOPYRIDINE INTUMESCENT AGENT

Shirley H. Roth, Highland Park, N.J., assignor to Cities Service Company, New York, N.Y.

No Drawing. Filed Feb. 11, 1972, Ser. No. 225,639

Int. Cl. C09d *5/18*; C09k *3/28*

U.S. Cl. 117—136 **6 Claims**

Intumescent compositions of the invention comprise certain arylsulfonamidopyridines, such as the 2-, 3-, and 4-sulfanilamidopyridines. The intumescent agents may be employed in conjunction with additives conventionally used in intumescent compositions. For use in protecting substrates from heat and fire, the intumescent compositions may be applied to a substrate in any suitable manner, such as by electrodeposition, spraying onto an adhesive substrate, or the application of a coating composition comprising the intumescent agent.

3,778,304

MAGNESIUM OXYCHLORIDE FIREPROOFING

Henry C. Thompson, Saratoga, Calif., assignor to Thompson Chemicals, Inc., Palo Alto, Calif.

No Drawing. Continuation-in-part of application Ser. No. 811,616, Mar. 28, 1969, which is a continuation-in-part of application Ser. No. 589,808, Oct. 27, 1966, both now abandoned. This application Nov. 1, 1971, Ser. No. 194,557

Int. Cl. C09k *3/28*; C04b *9/02*

U.S. Cl. 117—138 **4 Claims**

A method of making a foamed fireproof product of magnesium oxychloride cement and the resulting product. A porous substrate is impregnated with a foaming mixture of magnesium chloride, magnesium oxide, and frothing agent in water. The mixture hardens with small voids throughout the porous substrate, thus providing a fireproof product of low density. The foamed product may be formed in a mold with fibrous elements introduced into the foaming mixture. The cement mixture may be co-foamed with polyurethane foam. The fireproof products of relatively low density are particularly valuable for building and construction purposes. Magnesium powder is the preferred frothing agent which, in combination with a surfactant, induces a large volume of small bubbles that remain in the composition as it is set.

3,778,305

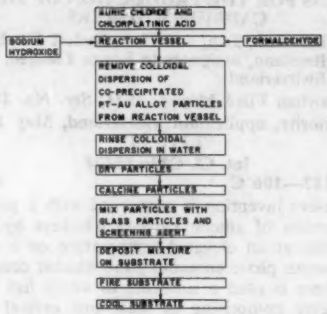
ELECTRICALLY CONDUCTIVE ELEMENT AND METHOD OF MAKING THE SAME

Curtis L. Holmes, Elkhart, Ind., and Lynn J. Brady, Edwardsburg, Mich., assignors to CTS Corporation, Elkhart, Ind.

Original application Aug. 2, 1968, Ser. No. 749,890. Divided and this application June 14, 1971, Ser. No. 153,024

Int. Cl. B44d *1/18*

U.S. Cl. 117—212 **14 Claims**



An electrically conductive composition mixed with a screening agent, is deposited on a substrate and fired at an elevated temperature to form a termination bonded to the substrate. The composition comprises a homogeneous mixture of approximately 70–95% by weight co-precipitated platinum-gold alloy particles, co-precipitated palladium-gold alloy particles or co-precipitated platinum-palladium-gold particles and approximately 5–30% by weight of glass frit.

3,778,306

TAPE

Robert H. Stow, White Bear, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation-in-part of abandoned application Ser. No. 703,872, Feb. 8, 1968. This application Jan. 4, 1971, Ser. No. 103,872

Int. Cl. B44c *1/18*; C09c *1/44*

U.S. Cl. 117—226 **3 Claims**

An electrically conductive pressure-sensitive adhesive tape comprising a flexible electrically conductive backing and an adhesive that includes a base soft rubber-resin adhesive material and conductive carbon black dispersed in the base adhesive material.

3,778,307

ELECTRODE AND COATING THEREFOR

Henri Bernard Beer, Kalmthout, Belgium, assignor to Chemnor Corporation, Panama City, Panama

Original application Feb. 2, 1968, Ser. No. 702,695, now Patent No. 3,632,498, dated Jan. 4, 1972. Divided and this application May 19, 1971, Ser. No. 144,882

Claims priority, application Great Britain, Feb. 10, 1967, 6,490/67

Int. Cl. B01k *3/04*

U.S. Cl. 117—221 **34 Claims**

A method of making a coated electrode for use in an electrolyte, the electrode made thereby, and the method

of using the electrode. At least part of the surface of a conductive base corresponding to the working area of the electrode is coated at least once with a solvent-containing composition of at least one material from which an oxide of a film-forming metal can be formed by evaporation and heating and at least one further material from which at least one non-film forming conductor can be formed by evaporation and heating. The base has at least

the outer surface portion thereof corresponding to the working area of the electrode made of a conductor resistant to the electrolyte in which the electrode is to be used. The solvent of said solution is evaporated, and the residue remaining on said base after evaporation is heated to deposit an electrically conductive coating on the electrode, which coating will transfer electrical energy between the electrolyte and the electrode. The electrode is used in various electrolytic processes.

3,778,308

MAGNETIC STORAGE DEVICE COATING AND PROCESS

Kent G. Roller, George H. Ahlborn, and Richard E. Brown, Boulder, Colo., assignors to Ball Brothers Research Corporation, Boulder, Colo.

No Drawing. Filed Dec. 18, 1970, Ser. No. 99,528

Int. Cl. H01f *10/00*

U.S. Cl. 117—234 **6 Claims**

The magnetic surfaces of magnetic storage devices are protected against abrasion and friction by applying a lubricating coating of a perfluoroalkyl polyether and an optional thin coating of a trifluorochloroethylene copolymer to the surface thereof. The perfluoroalkyl polyethers employed preferably have a molecular weight of at least 1000.

3,778,309

DESCALING PROCESS FOR ALLOYS CONTAINING CHROMIUM

Raymond Pennoyer Jackson, Suffern, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

No Drawing. Filed June 25, 1971, Ser. No. 157,005

Int. Cl. C23g *1/14, 1/28*

U.S. Cl. 134—2 **7 Claims**

Process for descaling high chromium alloy members in which the scaled alloy members are first provided with a coating of sodium carbonate and then heated to obtain a reaction between the coating and the scale. The reaction product is readily removed from the members, as by rinsing in water, for example, and the remaining scale may then be removed by conventional means, i.e., an acid pickling bath.

3,778,310

HIGH ENERGY DENSITY BATTERY HAVING UNSATURATED HETEROCYCLIC SOLVENT CONTAINING ELECTROLYTE

Bruce Hollis Garth, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 112,415, Feb. 3, 1971. This application May 1, 1972, Ser. No. 249,049

Int. Cl. H01m *11/00*

U.S. Cl. 136—100 R **9 Claims**

High energy density galvanic batteries having high utilization of active electrode material with low gas production can be prepared using voltaic cells having an anode of one of the light metals of Groups I–A or II–A of the Periodic Table, a compatible metal cathode and an electrolyte containing a solvent component consisting essentially of a mixture of from 5 to about 80% by weight of a five membered unsaturated heterocyclic hydrocarbon compound and complementally from 95 to about 20% by weight of a saturated ether and a dissolved salt having the formulas $MM'F_6$, MSCN or $MClO_4$ where M is Li, Na, or K and M' is P, As or Sb.

3,778,311

FOIL FOR GAS DIFFUSION ELECTRODES FOR ELECTROCHEMICAL CELLS AND PROCESS OF MAKING THE SAME

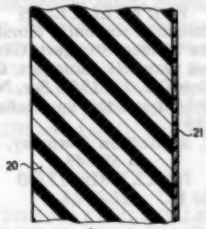
Hans Metzger, Tubingen-Lustnau, Klaus Brill, Korntal, and Friedrich Hornung, Stuttgart, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 9, 1972, Ser. No. 233,238

Claims priority, application Germany, Mar. 31, 1971, P 21 15 618.3

Int. Cl. H01m *13/00*

U.S. Cl. 136—120 FC **5 Claims**



An air-permeable, electrolyte-impermeable composite foil for self-breathing gas diffusion electrodes for use in electrochemical cells and in particular fuel cells, comprises a rigid sintered carrier foil of a fluorine-containing polymeric compound and, firmly bonded thereto, a non-sintered microporous layer of a fluorine containing polymeric compound. The foil is of light weight, thin and mechanically stable and thus forms an excellent support for a catalyst coating.

3,778,312

SOLAR CELL GENERATOR FOR FLIGHT MISSIONS IN THE VICINITY OF THE SUN

Siegfried Karius, Wedel, Holstein, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Jan. 22, 1969, Ser. No. 793,061

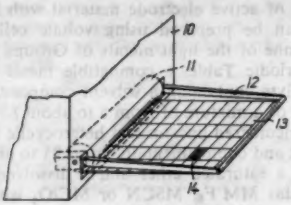
Claims priority, application Germany, Jan. 22, 1968, P 16 39 298.6

Int. Cl. H01l *15/02*

U.S. Cl. 136—89 **6 Claims**

A solar cell generator for use in spacecraft for missions in the vicinity of the sun. The generator includes a

support carrying a field of solar cells which are bounded by a leading end region and a trailing end region. The support is movable relative to the spacecraft between a retracted position, in which the field of solar cells is out of the path of solar radiation, and an exposed position wherein the field of solar cells is exposed to the solar radiation. The support is capable of occupying intermediate positions, in each of which the leading end region of the field of solar cells and a portion of the field are exposed. The field of solar cells is covered by means for



filtering the solar radiation. This filtering means has its minimum radiation permeability at the leading end region of the field and its maximum radiation permeability at the trailing end region, the radiation permeability thus increasing from the leading end to the trailing end region. The solar cell generator finally includes a device responsive to the amount of radiation striking the solar cells for moving the support between the retracted and the exposed positions to maintain a constant output from the field of solar cells.

3,778,313

METHOD OF MAKING AN OXYGEN ELECTRODE FOR FUEL CELLS

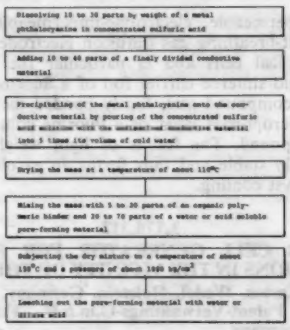
Harald Reber, Stuttgart-Feuerbach, Horst Jahnke, Gerlingen, and Walter Steiner, Stuttgart, Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Original application Oct. 23, 1967, Ser. No. 677,179, now abandoned. Divided and this application Mar. 3, 1971, Ser. No. 120,615

Claims priority, application Germany, Oct. 25, 1966, B 89,549

Int. Cl. H01m *13/00*

U.S. Cl. 136—120 FC **8 Claims**


Dissolving 10 to 30 parts by weight of a metal phthalocyanine in concentrated sulfuric acid
Adding 10 to 40 parts of a finely divided conductive material
Precipitating of the metal phthalocyanine onto the conductive material by pouring of the concentrated sulfuric acid solution with the conductive material into 5 times its volume of cold water
Drying the mass at a temperature of about 110°C
Mixing the mass with 5 to 20 parts of an organic polymeric binder and 20 to 70 parts of a water or acid soluble pore-forming material
Subjecting the dry mixture to a temperature of about 130°C and a pressure of about 1000 kg/cm²
Leaching out the pore-forming material with water or dilute acid

The oxygen electrode for use in a fuel cell is formed by dissolving 10 to 30 parts by weight of a metal phthalocyanine in concentrated sulfuric acid, adding 10 to 40 parts of a finely divided conductive material and causing precipitation of the solute onto the conductive material, drying the mass and mixing it with 5 to 20 parts of a binder and 20 to 70 parts of a pore-forming material and subjecting the dry mixture to heat and pressure followed by removal of the pore-forming material.

The electrode is acid resistant and can therefore be used in fuel cells operated with acidic electrolytes.

3,778,314

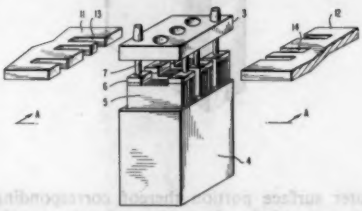
METHOD FOR JOINING COVER AND CASING OF A BATTERY

Seizo Kano, Uji, and Shinsaku Tanaka, Yoshiaki Mizoi, and Kenji Ojima, Kyoto, Japan, assignors to Japan Storage Battery Co., Ltd., Minami-ku, Kyoto-shi, Japan

Filed June 14, 1972, Ser. No. 262,881

Int. Cl. H01m *1/02*

U.S. Cl. 136—176 **5 Claims**



A method for joining the cover to the casing of a battery of a type wherein the cover and the casing are made of a thermo-plastic material and poles and connecting bars are embedded beforehand in the cover, involves the steps of elevating the cover a predetermined distance from said casing, inserting a plurality of comb-shaped heating plates having a plurality of slots, between the cover and the casing in such a manner that the poles are accommodated in the slots, depressing the cover so that required portions on the cover and casing are brought into contact with the heating plates, removing the heating plates, and depressing the cover against the casing so that the required portions of the cover and the casing are thereby bonded together completely.

3,778,315

COATING PROCESS

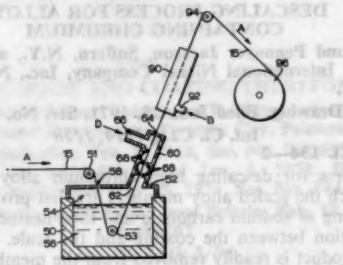
Philip P. Booker, Burlington, Ontario, and Richard Zeliznak, Thorold, Ontario, Canada, assignors to Cominco Ltd., Montreal, Quebec, Canada

Filed May 24, 1971, Ser. No. 146,107

Claims priority, application Canada, June 11, 1970, 85,200

Int. Cl. C23f *7/02*

U.S. Cl. 148—6.3 **8 Claims**



A process for the production of coloured coatings on articles coated with a carrier metal of zinc, tin or lead-tin

alloys having an oxygen-avid additive alloyed therewith, by oxidation of the said carrier metals to form an oxide film having discernible light interference colour effects. The oxide film thickness is controlled to produce desired colour effects such as by heating the coating during oxidation, by avoiding contact with preformed oxides and by pretreating articles to be coated to remove deleterious oxidizable elements, particularly in the operation of a continuous process.

3,778,316

METHOD FOR PRODUCING STAINLESS STEEL

Kenneth E. Pinnow, Jayendra M. Mehta, and Arthur Moskowitz, Pittsburgh, Pa., assignors to Crucible Steel Corporation, Pittsburgh, Pa.

No Drawing. Filed May 28, 1968, Ser. No. 732,542
Int. Cl. C22f *1/04*
U.S. Cl. 148—12 **2 Claims**

This invention relates to a stainless steel and a method for producing the same, whereby material particularly adapted for use in structural applications such as the manufacture of cargo boxes is achieved. Specifically, the material is characterized by an improved combination of strength and toughness that is achieved by producing hot-band material having a substantially martensitic microstructure of a composition consisting of .10 max. percent carbon, 2 max. percent manganese, 1 max. percent nickel, 9.5 to 13.5 percent chromium, and the balance iron. This material has a maximum titanium to carbon ratio of about 8. With titanium to carbon ratios of between 4 to 8, nickel must be present within the range of .5 to 1 percent. For optimum weld-toughness the maximum titanium to carbon ratio is about 4, either with or without nickel. To achieve the desired combination of strength and toughness, the material in hot-band gage is annealed for a time at temperature to achieve a hardness of at least 80 R_b and preferably 82 to 92 R_b.

3,778,317

METHOD FOR HEAT TREATMENT OF A THICK STEEL PLATE

Seinosuke Yano, Kitakyushu, Hiroshi Sakurai, Kawasaki, Nobuo Wakita, Inagi, and Hiroshi Mimura, Tokyo, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 29, 1971, Ser. No. 213,413
Claims priority, application Japan, Dec. 31, 1970, 46/123,752
Int. Cl. C21d *7/14*
U.S. Cl. 148—12 **4 Claims**

A method of heat treatment of a thick steel plate characterized in that a steel plate after hot rolling is cooled, directly from its finishing temperature or after cooling to an optional temperature below the Ar_1 transformation point is reheated to austenitize, and then cooled slowly at a cooling rate of less than 20° C. per minute in the range between the Ac_3 and Ar_3 transformation points, and is then hardened by a usual method.

3,778,318

COPPER BASE COMPOSITION

Walter L. Finlay, New York, N.Y., and Henry J. Fisher, Wellesley Hills, and Donald A. Hay, Medfield, Mass., assignors to Cooper Range Company, New York, N.Y.

Original application Feb. 24, 1969, Ser. No. 802,330, now Patent No. 3,677,745. Divided and this application June 7, 1972, Ser. No. 260,379
Int. Cl. C22c *9/00*; C22f *1/08*
U.S. Cl. 148—12.7 **11 Claims**

A copper-magnesium-phosphorous alloy (optionally containing silver and/or cadmium) wherein the magnesium is present in amounts from 0.01 to 5.0 weight percent, the phosphorous from .002 to 4.25 weight percent with copper making up the remainder. When silver or cadmium are employed, they are employed in amounts of from 0.02 to 0.2 weight percent and from 0.01 to 2.0 weight percent, respectively. These alloys have unexpectedly good combinations of mechanical heat resistance and conductivity properties.

3,778,319

HIGH-ENERGY PLASTIC-BONDED EXPLOSIVE

Theodore M. Benziger, Santa Fe, N. Mex., assignor to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Jan. 30, 1973, Ser. No. 327,898
Int. Cl. C06b *15/02*
U.S. Cl. 149—92 **1 Claim**

A high-energy, plastic-bonded explosive of the nominal composition 95 wt. percent HMX, 2.5 wt. percent Estane, and 2.5 wt. percent DNPAF having improved temperature stability and significantly better handling safety than standard plastic-bonded explosives.

3,778,320

NON-POLLUTING DISPOSAL OF EXPLOSIVES AND PROPELLANTS

Samuel J. Yosim, Woodland Hills, LeRoy F. Grantham, Calabasas, and Donald A. Huber, Canoga Park, Calif., assignors to Rockwell International Corporation

No Drawing. Filed June 20, 1972, Ser. No. 264,680
Int. Cl. C06b *1/04*
U.S. Cl. 149—109 **14 Claims**

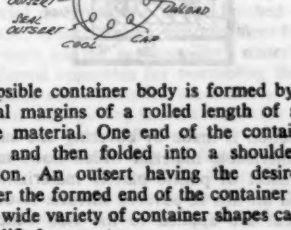
Unwanted explosives and propellants are destroyed in a safe non-polluting manner by being contacted with a hot molten salt containing as essential reactive component alkali metal carbonate or hydroxide or mixtures thereof. Some of the resulting decomposition products that would ordinarily be released as atmospheric pollutants react with or are retained in the melt. Any combustible matter present in the melt may be further reacted by use of oxidative molten salts alone or in combination with oxygen added to the melt. Formed gaseous products may be treated in a second reaction zone to complete oxidation of any combustible matter present before discharge of the gases to the atmosphere. The reactive component of the treated melt may be regenerated, or the melt may be disposed of, preferably by reaction with lime in an aqueous or molten medium to form a water-insoluble calcium salt residue. Particularly effective and preferred reactive molten salts are the NaOH-KOH and Li_2CO_3-Na_2CO_3-K_2CO_3 eutectic mixtures.

3,778,321

APPARATUS FOR MAKING ROLLED COLLAPSIBLE CONTAINER HAVING PLASTIC OUTSERT

Joseph L. Abbott, Loveland, Ohio, assignor to Victor Metal Products Corporation, Cincinnati, Ohio

Filed Oct. 14, 1971, Ser. No. 189,083
Int. Cl. B29c *27/00*; B65b *7/14*
U.S. Cl. 156—446 **16 Claims**

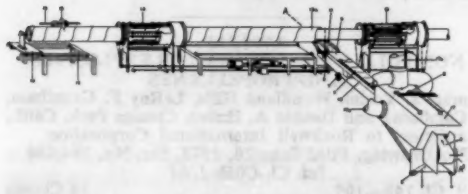


A collapsible container body is formed by sealing the longitudinal margins of a rolled length of a thin sheet of suitable material. One end of the container body is preformed and then folded into a shoulder and neck configuration. An outsert having the desired shape is slipped over the formed end of the container and secured thereto. A wide variety of container shapes can be formed using simplified apparatus.

3,778,322
PROCESS OF FORMING SPIRALLY WOUND PRODUCT

Donald George Keith, Mount Eliza, Victoria, Australia, Douglas Barrett Morris, Manley, England, Horst Egon Fred Ludwig Maack, Horgen, Switzerland, and Ernest Arthur Mason, Frodsham, and Robert John Woolgar, Northwich, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 22, 1971, Ser. No. 117,457
Claims priority, application Great Britain, Feb. 23, 1970, 8,478/70
Int. Cl. B65h *81/00*
U.S. Cl. 156—187 13 Claims

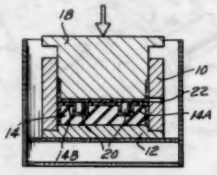


Process and apparatus for producing spirally wound products. The process comprises advancing a tubular or rod-like workpiece along its longitudinal axis while rotating it about the axis, by positive drive feeding a flexible ribbon tangentially to the rotating advancing workpiece at a preselected rate and preselected angle of less than 90° to the longitudinal axis thereof such that the resultant spiral ribbon windings form a sheath enveloping a greater cross-sectional area than that of the workpiece, providing a filling material in the space between the workpiece and the spiral ribbon windings and bonding the spiral ribbon windings together or to the workpiece or both.

3,778,323
METHOD OF MAKING A MOLD SECTION

Richard Posner, East Northport, N.Y., assignor to Creative Polymer Products Corp., Long Island City, N.Y.

Continuation-in-part of application Ser. No. 784,998, Nov. 25, 1968, now Patent No. 3,600,489. This application June 14, 1971, Ser. No. 152,810
The portion of the term of the patent subsequent to Aug. 16, 1988, has been disclaimed
Int. Cl. B29c *1/04;* B32b *31/00*
U.S. Cl. 156—212 8 Claims



A mold section is made by covering one surface of a slab of polymerizable material which flows under pressure with a sheet of plastic barrier material. A pattern is then placed on this so-covered surface. A compressive force and heat are applied to the slab which is then polymerized with the sheet bonded thereto.

3,778,324
PAD OF STACKED DETACHABLE SHEETS, AND METHOD AND ELEMENTS FOR MANUFACTURING THE SAME

Jean Lavigne, 57 Avenue Port-Royal des Champs, 78 Le Mesnil-Saint-Denis, France

Continuation-in-part of abandoned application Ser. No. 888,481, Dec. 29, 1969. This application Mar. 17, 1971, Ser. No. 125,068
Claims priority, application France, Dec. 30, 1968, 181,591; Mar. 19, 1970, 7009820
Int. Cl. B32b *7/14, 31/00*
U.S. Cl. 156—257 3 Claims

A new pad having a rigid stub and stacked detachable sheets is made by interposing between any two adjacent sheets at least one film of heat-activable glue, heating said stub portion to the activating temperature of said glue, applying pressure on said stub portion maintained at said temperature, then cooling the assembly at room temperature.

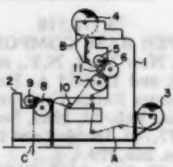
When the sheets are to be printed, the film of glue can preferably be replaced by a printing coating on a face of the stub of the said sheets, with a thermogluing ink.

This new pad can advantageously be used as a calendar.

3,778,325
METHOD OF MANUFACTURING ARTIFICIAL LEATHER

Saburo Oohara, Kyoto, Koitsuro Amemiya, Osaka, Yasushi Nishijima, Hirakata, Mitsuyoshi Fukushima, Tondabayashi, and Kunio Shimizu, Settsu, Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan

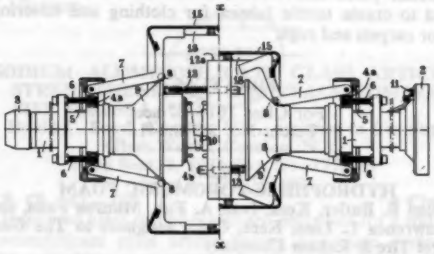
Original application Aug. 11, 1970, Ser. No. 62,947, now Patent No. 3,677,871. Divided and this application Feb. 17, 1972, Ser. No. 226,573
Int. Cl. B32b *31/24*
U.S. Cl. 156—278 11 Claims



Natural leather-like sheet materials of homogeneous microporous structure having high bending strength and excellent moisture-permeability and abrasion resistance, which are composed of four layers: a substrate layer of non-woven fabric finished with a synthetic butadienic rubber; a woven fabric layer; a microporous adhesive layer consisting of a specific polyurethane and conjoining

the above-mentioned two layer; and a microporous grain layer consisting of another specific polyurethane which has a dynamic modulus of elasticity higher than that of the adhesive layer and covers uniformly the top surface of the woven fabric layer. An improved process for manufacturing such sheet materials, which comprises setting a woven fabric superimposed on a substrate, simultaneously with coagulating a grain layer polyurethane resin laid on the woven fabric, and an apparatus employed therefor are also proposed.

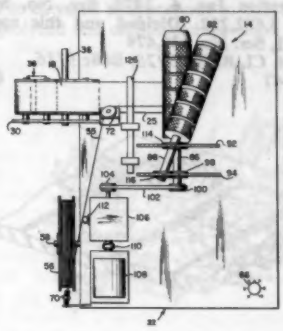
3,778,326
TIRE-MAKING DRUM
Georges Gazuit, Chemin Chauveau, 03 Montlucon, France
Filed June 21, 1971, Ser. No. 154,987
Claims priority, application France, Jan. 26, 1971, 7102503
Int. Cl. B29h *17/16*
U.S. Cl. 156—417 **4 Claims**



This tire-making drum intended notably for machines of the type utilized for making conventional or radial-ply heavy truck tires comprises on either side an assembly surrounding an axial spindle, each assembly comprising an annular sleeve rigid with the spindle and formed with end radial extensions forming with said sleeve and an annular cam member slidably mounted on said sleeve a variable-capacity chamber connected to a source of fluid under pressure. One extension of said sleeve is strap-shaped and has pivoted thereon a double-crank lever carrying on its first elbow a roller engaging a tapered outer face of said annular cam member, all the outermost rectilinear segments of the two opposite sets of levers are covered by a resilient membrane reinforced by inner blades and transverse members. Spring means urge the annular members symmetrically towards each other and towards the median plane of the drum. When these annular cam members are in their innermost position, i.e. close to said median plane, said chambers have zero capacity and the membrane has its maximum diameter; introducing pressure fluid into these chambers will move the annular cam members to their outermost position in which the membrane has its smallest diameter. The members reinforcing said resilient membrane are adapted to engage corresponding grooves formed in the outer surfaces of said outermost rectilinear segments of the double-crank levers.

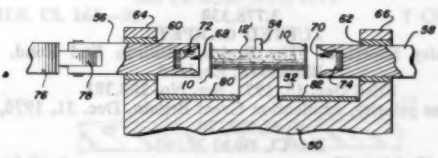
3,778,327
FLEXIBLE TUBING MANUFACTURING MACHINE
Wayne K. Fairchild, Santa Ana, Calif., assignor to Automation Industries, Inc., Century City, Los Angeles, Calif.
Filed Mar. 5, 1971, Ser. No. 121,419
Int. Cl. B31c *3/00*
U.S. Cl. 156—425 **7 Claims**

A machine is disclosed herein which is particularly adapted for continuously making an indefinite length of flexible ducting. The machine includes a mandrel upon which an indefinite length of a tape or strip of flexible material and an indefinite length of a flexible spiral spring are wound and bonded together to form the duct. The mandrel includes a pair of cylindrical rollers which are



rotatably positioned adjacent each other with their axes skew. As the strips of flexible material and spring are continuously wrapped around the rollers and bonded together, they advance axially along the rollers whereby a flexible duct is continuously produced.

3,778,328
METHOD FOR MANUFACTURING JET IMPINGEMENT TYPE FILTERS FOR SMOKING ARTICLES
Hoyt S. Beard, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed Aug. 13, 1971, Ser. No. 171,700
Int. Cl. A24c *5/50*; B31d *5/00*
U.S. Cl. 156—215 **4 Claims**



This improved process and apparatus for manufacturing jet impingement type filters for smoking articles utilizes a substantially air impervious sheet material and a rod of smoke pervious filter material. A tab of the sheet material is positioned over the end of the rod of filter material with peripheral areas of the tab extending radially outwardly from the longitudinal surface of the rod. The peripheral areas are folded over the end of the rod so as to form a cup-like enclosure or cap and are secured to the surface of the rod, preferably by a heat-activatable, pressure-sensitive adhesive which is precoated on the sheet material. Smoke passing perforations are provided in the sheet material and function, in the finished combination when smoked, as accelerating jets or orifices for the smoke which impinges on the pervious filter material.

The preferred apparatus for assembling the filter comprises a female die, means for successively aligning filter rods adjacent the opening therein with tabs of the sheet material therebetween and means for effecting relative reciprocal movement whereby the female die caps the tabs over the filter ends. The resulting filter plug is then disposed in gaseous communication with a smokable material such as a cigarette rod by, for example, an overwrap of conventional tipping paper.

3,778,329

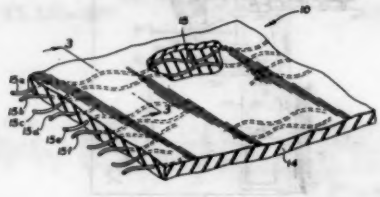
REINFORCED TIRE FABRIC OF HELICALLY FORMED, LATERALLY SPACED, SINGLE FILAMENT WIRES

Sterling W. Alderfer, Akron, Ohio, assignor to The Steelastic Company, Akron, Ohio

Original application Jan. 6, 1970, Ser. No. 858, now Patent No. 3,682,222. Divided and this application Apr. 22, 1971, Ser. No. 136,479

Int. Cl. B29h *17/28;* **B60c** *9/16*

U.S. Cl. 161—47 **6 Claims**



A reinforced tire fabric comprising an elastomeric body portion in which a plurality of helically formed, single filament wires constitute the reinforcing. The helix delineated by each reinforcing wire has a relatively long lay and the diameter thereof is preferably no greater than three times the diameter of the wire itself. The wire filaments may be cold formed into their respective helices by being drawn through relatively rotatable orifice means—adjacent filaments preferably being opposite hand—and encapsulated into a continuously extruded ribbon that is manipulated and appropriately severed to form the fabric. The ribbon may be wound into an annulus that is subsequently slit into a ply strip, or successive lengths of the ribbon may be joined into a ply strip. By either approach the bias of the reinforcing filaments in the finished tire may be preselected.

3,778,330

TUFTED CARPET

Stanley Shorrock, "The Braids," Billinge End Road, Blackburn, England

Filed Dec. 15, 1971, Ser. No. 208,381

Claims priority, application Great Britain, Dec. 31, 1970, 62,093/70

Int. Cl. D03d *27/00*

U.S. Cl. 161—67 **1 Claim**

A process for making a tufted carpet in which cylindrical tufts of pile yarn are inserted in a backing fabric so that long ends project on one side to form a pile, and short ends project on the other side. The filaments of the short ends are splayed apart and fixed to the backing fabric with an adhesive.

3,778,331

STATIC-CHARGE RESISTANT SYNTHETIC YARNS

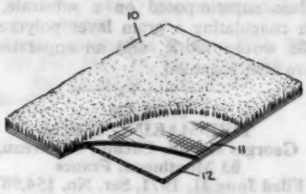
Walter G. Scharf, Forge Hollow, Lakeville, Conn. 06039

Filed Oct. 6, 1971, Ser. No. 187,082

Int. Cl. A47g *27/02;* **B32b** *15/08, 27/34*

U.S. Cl. 161—67 **6 Claims**

A static-charge resistant yarn constituted by a non-woven permeable paper ribbon whose faces are vacuum-plated with tin or other non-oxidizing metal that impregnates the paper to create, a non-reflective, electrically conductive, static discharge path. The paper ribbon preferably formed of non-woven nylon fibers, is twisted,



texturized or wrapped about a filamentary core to form a metallized textile yarn which is intermixed with conventional yarns and woven, tufted or other wise processed to create textile fabrics for clothing and coverings or for carpets and rugs.

ERRATUM

For Class 161—87 see:
Patent No. 3,778,241

3,778,332

HYDROPHILIC-POROMERIC FOAM

Eugene B. Butler, Kent, Ivan A. Fak, Munroe Falls, and Lawrence L. Line, Kent, Ohio, assignors to The General Tire & Rubber Company

No Drawing. Original application June 1, 1970, Ser. No. 42,592, now Patent No. 3,644,229. Divided and this application July 28, 1971, Ser. No. 167,018

Int. Cl. B32b *3/26, 5/18*

U.S. Cl. 161—159 **3 Claims**

This invention is a hydrophilic and poromeric foam made by a unique process that is adapted to be made into a synthetic leather-like material having many of the desirable aesthetic and physical properties of natural leather and, in addition, is made from relatively inexpensive materials.

3,778,333

MICROPLEATED COMPOSITE FIBROUS PRODUCT

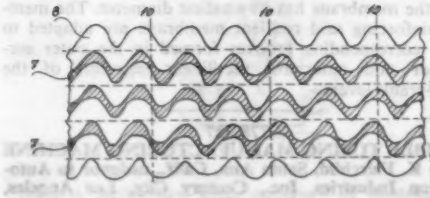
Ole-Bendt Rasmussen, Copenhagen, Denmark (7 Topstykket, 3460 Birkerod, Denmark)

Continuation-in-part of abandoned application Ser. No. 751,205, Aug. 8, 1968. This application May 27, 1971, Ser. No. 147,496

Claims priority, application Great Britain, Aug. 9, 1967, 36,531/67

Int. Cl. B32b *3/28, 5/02*

U.S. Cl. 161—169 **10 Claims**



Filaments, fibres and fibre-like structures consisting of thin ribbon-like layers formed of different polymeric materials and transversely pleated with the spacing between adjacent pleats being up to about 100μ. To make

an intermediate product, a sandwich-like structure having microscopically thin layers is simultaneously compressed in one direction in the plane of the layers and expanded perpendicularly thereto, also in the plane of the layers under conditions at which the materials of the layers are in states of different fluidity. The intermediate product is subjected to splitting action to form the final product.

3,778,334

HIGH MODULUS ORGANIC FIBER LAYERS ALTERNATING WITH INORGANIC FIBER LAYERS IN A RESIN MATRIX

Donald L. G. Sturgeon, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Apr. 20, 1971, Ser. No. 135,800
Int. Cl. B32b *5/12, 5/28*
U.S. Cl. 161—156 **7 Claims**

Fibrous reinforced resin composites comprising high modulus organic fibers and inorganic fibrous materials in specified proportions demonstrate surprising increases in a structural property above those predicted by the Rule of Mixtures.

3,778,335

SODIUM ALUMINOSILICATE GLASS ARTICLE STRENGTHENED BY A SURFACE COMPRESSIVE STRESS LAYER

David C. Boyd, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Sept. 2, 1971, Ser. No. 177,345
Int. Cl. B32b *33/00*
U.S. Cl. 161—164 **4 Claims**

Improved glass compositions are described for a sodium aluminosilicate glass article having a surface compressive stress layer that strengthens the article. The surface compressive stress layer is chemically developed by an ion exchange in which a relatively large monovalent ion is introduced into the surface of the glass article in exchange for the sodium ion at a temperature below the strain point of the glass. The improved compositions provide glasses having unusual liquidus characteristics, and consist essentially, on an oxide basis in mole percent, of 5–25% Na_2O, 1–5% MgO, an amount of ZrO_2 effective to improve chemical durability of the strengthened glass but not over 3%, at least 8% Al_2O_3, the total ZrO_2 plus Al_2O_3 being not over 13.5%, and the balance essentially silica.

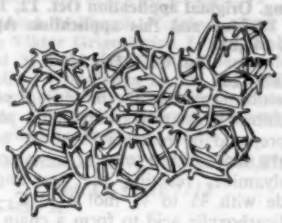
3,778,336

HEAT RESISTANT AND OXIDATION RESISTANT STRUCTURES

Whitney R. Adams, Northshire, Wilmington, Del., assignor to Scott Paper Company, Philadelphia, Pa.

Continuation of abandoned application Ser. No. 488,019, Sept. 17, 1965. This application May 8, 1969, Ser. No. 824,751
Int. Cl. B32b *3/12*
U.S. Cl. 161—168 **18 Claims**

Porous cellular structures comprised of an infusible resin, which may or may not be pyrolyzed or carbonized wholly or in part, and which may be a coating upon a skeletal structure which is the pyrolyzed product of the material comprising an original structure, the infusible resin having a coating thereon of a suitable heat-resistant and oxidation-resistant resin which may be either thermoplastic or thermosetting. A method for treating cellular structures to form the above structures from materials which fuse or melt at relatively low temperatures, that is, below about 400° F. such that the finally evolved product will assume substantially the same physical or structural shape of the relatively low fusion temperature material and yet will provide a structure which is relatively stable and possess greater strength at higher temperatures, that is, on the order of 700° F. or higher. In the method, a first basic structure having a desired configuration and comprised of material having a low fusion or deterioration temperature is coated at even lower temperatures with an infusible resin which is capable of being cured at a temperature lower than the relatively low fusion or deterioration temperature of the material comprising the first basic structure. The resulting coated structure is then subjected to elevated temperatures so that the basic structure is pyrolyzed and carbonized leaving a stronger, high-



temperature-resistant structure substantially in the image of said first basic structure. The above structure is then coated with any one of a number of high temperature-oxidation-resistant organic resins having a fusion temperature and a viscosity such that they will adhere to a structure and maintain an integral oxidation-resistant coating at temperatures of up to 700° F. and even higher.

3,778,337

DECORATIVE WALL COVERING

Emery M. Mand and Henry C. Shapiro, Los Angeles, Calif., assignors to California Weavers, Inc., Los Angeles, Calif.

Filed July 22, 1971, Ser. No. 165,269
Int. Cl. B32b *3/26, 5/18*
U.S. Cl. 161—95 **7 Claims**

A decorative wall covering including a woven material such as jute having strands therein of different and varying thicknesses. A fire-retardant foam backing is bonded to the woven material and penetrates the weave to varying depth, depending upon the thickness of the strands at any given location.

3,778,338

TOUGHENED GLASS

David Duncan Murphy, Leamington Spa, and David George Giddings, Stourbridge, England, assignors to Pilkington Brothers Limited, Liverpool, England

No Drawing. Original application Dec. 30, 1969, Ser. No. 889,340, now Patent No. 3,679,388. Divided and this application Feb. 9, 1972, Ser. No. 224,944
Int. Cl. C03b *27/00;* B32b *17/10*
U.S. Cl. 161—192 **8 Claims**

A toughened glass article, in particular a sheet of soda-lime-silica glass of thickness in the range 4 mm. to 12 mm. has a central tensile stress in the range 500 kg./cm.² to 1200 kg./cm.² and a stress ratio of surface compressive stress to central tensile stress in the range 2:1

to 4:1. A toughened glass sheet may be embodied in a laminated assembly for example an aircraft windscreen assembly.

3,778,339

PAPER CONTAINING A POLYAMIDEPOLYAMINE-EPICHLOROHYDRIN WET STRENGTH RESIN

Laurence Lyman Williams, Stamford, and Anthony Thomas Coscia, South Norwalk, Conn., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Original application Oct. 12, 1970, Ser. No. 80,181. Divided and this application Apr. 14, 1972, Ser. No. 244,313

Int. Cl. D21h *3/58*

U.S. Cl. 162—164 **2 Claims**

Water-soluble cationic thermosetting polyamidepolyamine-epichlorohydrin resins containing phenylene linkages are prepared by reacting ⅓ to ¾ mol of a non-orthophthalic acid with 1 mol of a water-soluble polyalkylenepolyamine, reacting the resulting monomeric phthalamide with ⅖ to ¼ mol of a C_3–C_{10} saturated aliphatic dicarboxylic acid to form a chain polymer (the total amount of the acids being ¾ to 5/4 mol per mol of the polyamine), and rendering the chain polymer thermosetting by reaction with epichlorohydrin. The polymers are wet strength resins for paper.

3,778,340

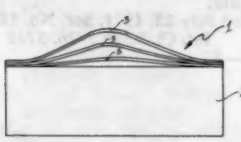
INSULATING DEVICES FOR AUTOMOBILE MANIFOLDS AND METHODS OF MAKING AND USING THE SAME

William H. McNiff, 9858 Valley Drive, St. Louis, Mo. 63137

Filed Sept. 17, 1971, Ser. No. 181,301

Int. Cl. B32b *15/20, 17/06;* F01n *7/10*

U.S. Cl. 161—39 **3 Claims**



The present invention relates to an insulating device for use on automobile manifolds and the like which may be manually installed without fasteners comprising base means composed of a suitable flexible insulating material and a plurality of elongated aluminum foil backing strips operably fastened at opposite extremities of said base means.

ERRATUM

For Class 162—164 see:
Patent No. 3,778,339

3,778,341

NONWOVEN TEXTILE FABRICS AND METHODS OF MAKING THE SAME

Charles H. Plummer, Princeton, and Donald V. Skistimas, Milltown, N.J., assignors to Johnson & Johnson

Filed Mar. 17, 1971, Ser. No. 125,034

Int. Cl. D21f *11/04*

U.S. Cl. 162—125 **21 Claims**

A nonwoven textile fabric having excellent softness, drape, and hand, as well as excellent tensile, burst, and tear strengths and stitch-like qualities of comprising: (1) a relatively flat, sheet-like fibrous portion of overlapping and intersecting structural textile fibers having an average length of from about ¼ inch to about 1¼ inches or more, in which structural fibrous portion there may be included relatively short fibers having an average length of from about ⅛ inch to about 1/25 inch or less; and (2) a relatively flat, sheet-like fibrous portion of relatively short fibers having an average length of from about ⅛ inch to about 1/25 inch or less, the individual fibers of each fibrous portion, as well as the fibrous portions themselves, being adhered and bonded to each other by interfiber entanglement and by discrete resin binder materials

adhered to the individual fibers thereof, the individual fibers of the structural fibrous portion being additionally bonded to each other by an intermittent print pattern of discrete synthetic resin binder areas, whereby a nonwoven textile fabric is obtained having excellent softness, drape and hand, as well as excellent tensile, burst, and tear strengths and stitch-tear qualities. Methods of making such nonwoven textile fabrics and particularly methods involving the use of wet-forming manufacturing techniques are also included.

3,778,342

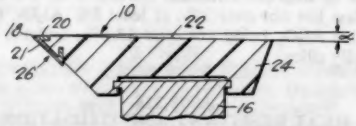
WEAR RESISTANT OUTSERT FOR A PAPER MACHINE FOIL

Fernand Armand Charbonneau, Brossard, Quebec, Canada, assignor to JWI Ltd., Montreal, Quebec, Canada

Filed Apr. 12, 1971, Ser. No. 133,020

Int. Cl. D21f *1/48*

U.S. Cl. 162—352 **22 Claims**



A paper machine foil having a wear resistant outsert releasably yet securely positioned thereon to form the supporting surface, doctoring surface and leading edge of the foil. The leading edge of the outsert is formed by a small radius of curve and a wear resistant coating is applied to the supporting surface, the leading edge and a portion of the doctoring surface of the outsert.

3,778,343

DEVICE FOR PLASMA CONFINEMENT AND HEATING BY HIGH CURRENTS AND NON-CLASSICAL PLASMA TRANSPORT PROPERTIES

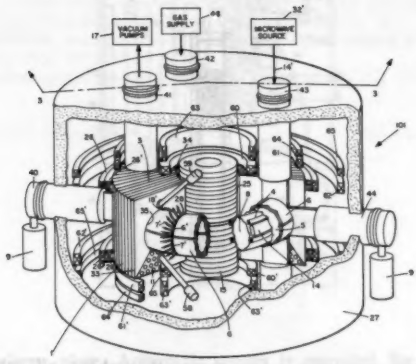
Bruno Coppi, Winchester, and Donald B. Montgomery, Wayland, Mass., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Mar. 11, 1971, Ser. No. 123,319

Int. Cl. G21b *1/00*

U.S. Cl. 176—3 **11 Claims**

Toroidal plasma containment device having means for inducing high total plasma currents and current densities



magnetic modulation, microwave-induced heating, and diagnostic accessibility.

3,778,344

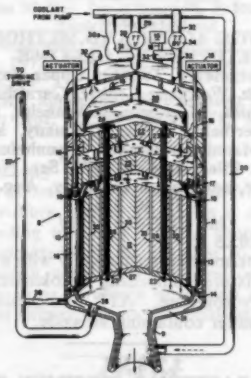
NUCLEAR ENGINE FLOW REACTIVITY SHIM CONTROL

Joseph M. Walsh, Pittsburgh, Pa., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Mar. 21, 1968, Ser. No. 715,132

Int. Cl. G21c *7/28*

U.S. Cl. 176—22 **15 Claims**



A nuclear engine control system is provided which automatically compensates for reactor reactivity uncertainties at the start of life and reactivity losses due to core corrosion during the reactor life in gas-cooled reactors. The coolant gas flow is varied automatically by means of specially provided control apparatus so that the reactor control drums maintain a predetermined steady state position throughout the reactor life. This permits the reactor to be designed for a constant drum position and results in a desirable, relatively flat temperature profile across the core.

3,778,345

DEVICE FOR ENGAGING AND DISENGAGING PINION AND RACK IN DRIVE OF NUCLEAR REACTOR REGULATING ELEMENT

Boris Arkadievich Maslenok, Kolpino, ulitsa V. Slutskoi 34, kv. 40; Viktor Grigorievich Zlobin, Kolpino, ulitsa V. Slutskoi 38, kv. 223; Anatoly Sergeevich Khegai, Kolpino, ulitsa Vokzalnaya 11, kv. 10; Vladimir Petrovich Nikolaev, Kolpino, ulitsa Proletarskaya 58, kv. 91; and Evgeny Adolfovich Krjuger, Zanevsky prospekt 51, kv. 12, all of Leningrad, U.S.S.R.

Filed Mar. 31, 1972 Ser. No. 240,078

Int. Cl. G21c *7/12*

U.S. Cl. 176—36 R **1 Claim**

The invention relates to a device for engaging and disengaging the pinion and rack in the drive of a nuclear reactor regulating element.

The device according to the invention is characterized in that the electromagnet which engages the pinion with, and disengages it from, the rack is installed coaxially with the rack axis whereas the swinging balance arm carrying the pinion is connected with the electromagnet core by articulated rods set at an acute angle to the rack axis.

This simplifies the drive of the regulating element, reduces the lateral dimensions of the drive and cuts down the time elapsing from the moment of receiving the signal for the movement of the regulating element in the reactor zone to the beginning of its movement both under the regulating and emergency protection conditions.

3,778,346

NUCLEAR POWER STATION

Oskar Profos, Winterthur, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Sept. 16, 1968, Ser. No. 762,185

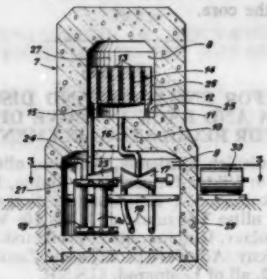
Claims priority, application Switzerland, Sept. 29, 1967, 13,103/67

Int. Cl. G21c *13/10*

U.S. Cl. 176—60 **7 Claims**

The nuclear power station is constructed to house the reactor pressure vessel above the machine room ceiling

with the ceiling being of a thin thickness. Should a leak of working medium occur in the machine room, the pressure on the ceiling of the machine room is counterbalanced by the weight of the reactor.



3,778,347

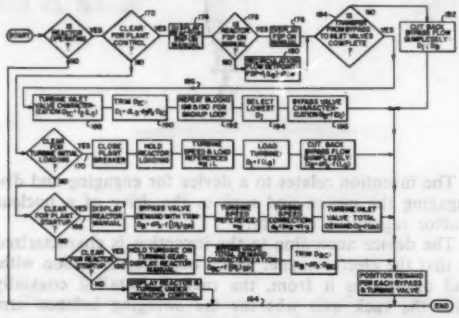
METHOD AND SYSTEM FOR OPERATING A BOILING WATER REACTOR-STEAM TURBINE PLANT PREFERABLY UNDER DIGITAL COMPUTER CONTROL

Theodore C. Giras, 336 Sharon Drive, Pittsburgh, Pa. 15221, and Leaman B. Podolsky, 714 W. 38th St., Wilmington, Del. 19802

Continuation of abandoned application Ser. No. 779,091, Nov. 26, 1968. This application Sept. 27, 1971, Ser. No. 184,157

Int. Cl. G21c *7/36*

U.S. Cl. 176—24 21 Claims



A digital computer control system operates a boiling water nuclear reactor and a steam turbine in an electric power plant. The computer applies feedforward control to the reactor system and to the turbine inlet and bypass steam valves to meet plant load demand within throttle pressure constraints. The plant is operated by the computer in the turbine follow mode or the coordinated mode.

3,778,348

NUCLEAR FUEL ELEMENT WITH AXIALLY ALIGNED FUEL PELLETS AND FUEL MICROSPHERES THEREIN

John D. Sease and Francis E. Harrington, Knoxville, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

Continuation-in-part of application Ser. No. 115,118, Feb. 12, 1971, now Patent No. 3,683,975. This application July 3, 1972, Ser. No. 268,261

Int. Cl. G21c *3/26, 3/28*

U.S. Cl. 176—67 2 Claims

Elongated single- and multi-region fuel elements are prepared by replacing within a cladding container a coarse fraction of fuel material which includes plutonium and uranium in the appropriate regions of the fuel element and then infiltrating with vibration a fine-sized fraction of uranium-containing microspheres throughout all interstices in the coarse material in a single loading. The fine, rigid material defines a thin annular layer between the coarse fraction and the cladding to reduce adverse mechanical and chemical interactions.

3,778,349

PRODUCTION OF SINGLE CELL PROTEIN MATERIAL

Guy R. Carta, Blacksburg, Va., assignor to Research Corporation, New York, N.Y.

No Drawing. Filed June 7, 1971, Ser. No. 150,798

Int. Cl. C12b *1/00*

U.S. Cl. 195—33 3 Claims

A single cell protein material useful as an animal feed or human food supplement is prepared by culturing the microorganism *Cellulomonas cartalyticum* (ATCC No. 21681). A suitable substrate for culturing this microorganism for growth and production of the cell protein material is an aqueous cellulose-containing medium, such as papermill white water.

3,778,350

DIAGNOSTIC AGENT AND METHOD FOR DETERMINING GLUCOSE

Hans Ulrich Bergmeyer, Tutzing, Upper Bavaria, Erich Bernt, Munich, Wolfgang Gruber, Garatshausen, Felix Helmut Schmidt, Mannheim-Seckenheim, and Harald Stork, Lampertheim, Hesse, Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

No Drawing. Filed Aug. 5, 1970, Ser. No. 61,503

Claims priority, application Germany, Aug. 11, 1969, P 19 40 816.3

Int. Cl. G01n *31/14*

U.S. Cl. 195—103.5 C 8 Claims

Glucose is determined enzymatically with a stable diagnostic agent mixture comprising hexokinase, glucose-6-phosphate dehydrogenase, ATP, magnesium sulfate, NADP, and a buffer containing an azide.

3,778,351

AUTOMATIC BACTERIAL SPECIMEN STREAKER

Robert J. Rosov, Springfield, Oreg., assignor to Oregon Research Institute, Eugene, Oreg.

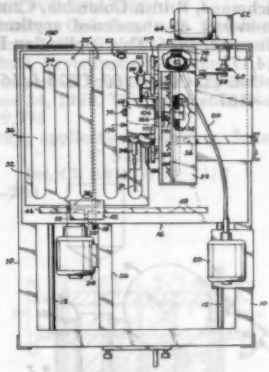
Filed Mar. 16, 1971, Ser. No. 124,802

Int. Cl. C12k *1/10*

U.S. Cl. 195—127 8 Claims

A frame mounts a table for controlled movement in the longitudinal direction of a specimen plate supported on the table while a disposable pipette mounted on a subframe above the specimen plate oscillates transversely of the latter to deposit a specimen on the plate in a sinus-

oidal pattern. Means is provided for controlling the volume rate of delivery of specimen from the pipette to the



specimen plate. Automatic means is provided for discarding each pipette after use and for producing pipettes from a supply coil of plastic tubing.

3,778,352

PLASMINOGEN ASSAY SYSTEM

Robert C. Bishop, San Gabriel, Lajos F. Fekete, Valinda, and Edward Shanbrom Santa Ana, Calif., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

No Drawing. Continuation of abandoned application Ser. No. 764,628, Oct. 2, 1968. This application Feb. 23, 1973, Ser. No. 335,278

Int. Cl. G01n *13/00, 31/14, 33/16*

U.S. Cl. 195—99 **5 Claims**

Plasminogen in blood plasma is quantitatively determined by measuring the diameter of the clear radial diffusion zone produced by the reaction of the blood plasma with known amounts of clotted fibrinogen and plasminogen suspended in a stable gel medium.

3,778,353

REMOVING A CELL CULTURE FROM A CARRIER

Hans Muller, Im Allmendli, Erlenbach, Zurich, Switzerland

Continuation-in-part of application Ser. No. 274,063, July 21, 1972. This application Mar. 6, 1973, Ser. No. 338,509

Claims priority, application Switzerland, Aug. 13, 1971, 11,986/71; Apr. 6, 1972, 5,095/72; Apr. 28, 1972, 6,457/72

Int. Cl. C12b *1/00*

U.S. Cl. 195—105 **5 Claims**

A method of removing a cell culture from the surfaces of a spiral culture carrier located in a chamber is disclosed, according to which a slurry containing granular particles is admitted into the chamber so as to surround the spiral carrier, whereupon the spiral carrier is rotated in the slurry so as to obtain separation of the cell culture from the carrier due to frictional retardation of the cell culture.

3,778,354

USE OF COBALT IN A NONORGANIC COPPER SULFATE ELECTROPLATING BATH

Emil Toledo, Natick, Mass., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Sept. 13, 1972, Ser. No. 288,611

Int. Cl. C23b *5/34*

U.S. Cl. 204—44 **12 Claims**

An inorganic copper sulfate bath for electroplating copper is provided which contains minor quantities of cobalt.

3,778,355

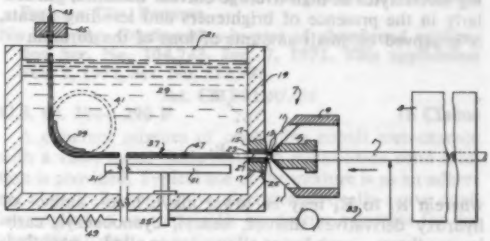
METALLIC COVERING OF CONTINUOUS METALLIC CORE MATERIAL

Keith N. Johnson, Cumberland, R.I., and Paul O. Hagarman, North Attleboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 25, 1968, Ser. No. 770,678

Int. Cl. C23b *5/18, 5/58, 5/60*

U.S. Cl. 204—28 **2 Claims**



A core-forming wire, to be covered with metal, is continuously drawn first through a circumferential milling device for skin removal and then through an axially operating shaving and protective die to provide a virgin surface. From the shaving die it moves in uncontaminated condition into a bath for applying a metal cover or sheath to its surface by electroplating, hot-dipping, tinning or the like. The core is in covered condition after leaving the bath and after solidification of the sheathing material is passed through suitable finishing means.

The electroplating, hot-dipping or tinning of continuous lengths of core-forming metal for forming a different metallic coating or sheath thereon requires that the core surfaces be very clean. This is particularly true in the case of aluminum wire required to be electroplated with copper, for aluminum is extremely prone to rapid reoxidation in air after oxide removal. Such oxide acts as a contaminant interfering with application of a satisfactory metal covering. Thus the invention is particularly useful for improvedly electroplating a copper sheath on an aluminum core wire but it is also useful for other combinations of core and covering metals employing hot-dipping, tinning or the like.

3,778,356

PROCESS FOR THE ELECTROLYTIC FORMATION OF ALUMINUM COATINGS ON METALLIC SURFACES IN MOLTEN SALT BATH

Akira Miyata, Chikayoshi Tomita, and Akio Suzuki, Tokyo, and Hideyo Okubo and Masahiko Nagakuni, Kanagawa-ken, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

No Drawing. Application Mar. 24, 1969, Ser. No. 828,049, now Patent No. 3,699,012, which is a division of application Ser. No. 507,034, Nov. 9, 1965, now Patent No. 3,480,521. Divided and this application July 6, 1970, Ser. No. 60,994

Claims priority, application Japan, Nov. 13, 1964, 39/63,827; Feb. 24, 1965, 40/10,330, 40/10,331

Int. Cl. C23b *5/22, 5/48*

U.S. Cl. 204—29 **2 Claims**

Process for coating electrolytically metallic surfaces with aluminum in a molten salt bath containing aluminum chloride. The metallic surface is coated with an inorganic aqueous solution and then is electrolytically coated in the bath. The process results in coatings of superior smoothness and bonding strength between the surfaces.

3,778,357
ELECTROLYTE AND METHOD FOR ELECTRODEPOSITING COPPER

Wolfgang Dahms and Hans-Gunther Todt, Berlin, Germany, assignors to Schering AG, Berlin and Bergkamen, Germany

No Drawing. Filed Dec. 22, 1972, Ser. No. 317,720
Claims priority, application Germany, Jan. 26, 1972, P 22 04 326.1
Int. Cl. C23b 5/20, 5/46
U.S. Cl. 204—52 R 5 Claims

The throwing and covering power of acid copper plating electrolytes at high average current densities, particularly in the presence of brighteners and levelling agents, is improved by small amounts of ions of the formula

wherein R_1 to R_4 may be lower alkyl, halo-, amino- or hydroxy derivatives thereof, benzyl, cyanobenzyl, carb-lower-alkoxy, carb-lower-alkoxy-lower-alkyl, naphthyl-lower - alkyl, trialkyl - phosphonium-alkyl-diphenylalkyl, phenyl, cycloalkyl having 5 to 8 carbon atoms, or lower alkenyl. Additionally, R_1 and R_2 jointly with the P may constitute phosphindolinium, and R_4 may also be

$$-(CH_2)_n-Y^-$$

wherein n is an integer between 1 and 4, and Y is SO_3, SO_4, PO_4, PO_3, or CO_2.

3,778,358
ZINC PLATING SOLUTION

Kenneth Urmston Holker, Kidderminster, England, assignor to Albright & Wilson Limited, Oldbury, near Birmingham, England

No Drawing. Filed July 6, 1972, Ser. No. 269,396
Claims priority, application Great Britain, July 20, 1971, 33,891/71
Int. Cl. C23b 5/12, 5/46
U.S. Cl. 204—55 R 15 Claims

Electrolyte solution for use in the electrodeposition of zinc comprises an aqueous solution of (A) zinc sulphamate and (B) fluoroboric acid and/or one or more soluble salts of fluoroboric acid and/or a combination of fluoroboric acid and hydrofluoric acid. Preferred solutions comprise 0.5 to 4 mols per litre zinc sulphamate and 0.01 to 0.5 mols per litre fluoroboric acid. Brightening agents, e.g. 1 to 75 gms. per litre boric acid, and levelling agents, e.g. 0.05 to 1 gm. per litre gelatin, may also be present.

3,778,359
ZINC ELECTROPLATING BATHS AND PROCESS

Francine Popescu, nee Micsunescu, 32 Rue Etienne Solet, 94 Saint Maur, Val-de-Marne, France

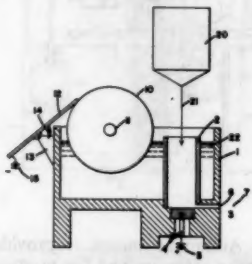
No Drawing. Continuation-in-part of application Ser. No. 105,119, Jan. 8, 1971. This application Mar. 8, 1972, Ser. No. 232,916
Int. Cl. C23b 5/12, 5/46
U.S. Cl. 204—55 R 13 Claims

A zinc electroplating bath has a pH between 3.5 and 7.5 and; in addition to the usual zinc salts, conducting salts, buffering salts, complex forming salts; includes (a) a brightening agent of the type produced by the reaction of acetylenic alcohols with aromatic aldehydes or aromatic ketones, (b) a wetting agent of the type produced by condensation of ethylene oxide, (c) about 0.1–20 grams/liter of a monocarboxylic aromatic acid (or salt thereof) having the carboxyl group bonded directly to the aromatic nucleus, and (d) about 0.05–5 grams/liter of an aromatic aldehyde or aromatic ketone.

3,778,360
PROCESS FOR THE ELECTROLYTIC RECOVERY OF COPPER FROM ITS ORES

John Gordy, 1011 Dennis Crescent E., Richmond, British Columbia, Canada

Continuation-in-part of abandoned application Ser. No. 558,419, June 17, 1966. This application Feb. 25, 1970, Ser. No. 14,172
Int. Cl. C09d 1/00; C22d 1/16
U.S. Cl. 204—107 12 Claims

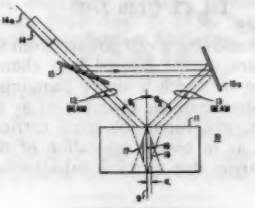


This invention relates to a method of solubilizing copper metal from copper ores, such as copper sulfide ores comprising the step of electrolyzing a slurry of the finely ground ore, in the presence of a catalyst, in the anodic chamber of an electrolytic cell, said catalyst comprising an ion complex of cuprous chloride in aqueous hydrogen chloride and plating coper metal on the cathode. An ion-permeable membrane is used to separate the anodic compartment containing ore slurry from the cathodic compartment.

3,778,361
PROCESS FOR RENDERING TRANSPARENT MEDIA ARTIFICIALLY OPALESCENT AND RESULTING PRODUCT

Jeofry Stuart Courtney-Pratt, Locust, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed Sept. 1, 1972, Ser. No. 285,823
Int. Cl. B01j 1/10
U.S. Cl. 204—157.1 R 11 Claims



An opalescent effect is created artificially in suitable bulk material by the interference of two beams directed into the material at the Bragg angle. Optical energy is thus concentrated along desired planes and a planar alteration of refractive index along these planes is achieved. Suitable bulk materials include polymethyl methacrylate. A general class of suitable materials is characterized. Production techniques are set forth.

3,778,362

ELECTROLYTIC APPARATUS INCLUDING BIPOLAR ELECTRODES DEFINING AN ENCLOSED VOLUME AND HELD IN A NON-CONDUCTIVE FRAME

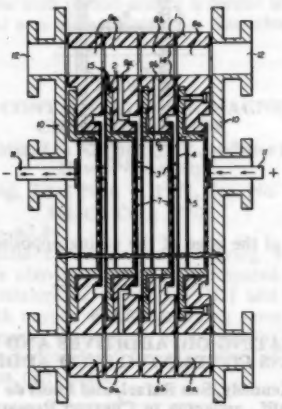
Herbert Wiechers, Opladen, and Reinhard Heikaus, Cologne-Stammheim, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of abandoned application Ser. No. 739,470, June 24, 1968. This application Nov. 17, 1971, Ser. No. 199,776

Claims priority, application Germany, June 27, 1967, F 52,800

Int. Cl. B01k *3/04, 3/10*

U.S. Cl. 204—254 **10 Claims**



Bipolar hollow plate electrode unit including an electrically conductive spacer body having a pair of opposed end face portions carrying respectively a cathode plate electrode and an anode plate electrode in transverse spaced relation to define thereby a hollow space between said electrodes, said plate electrodes being electrically interconnected through said spacer body at said end face portions, the spacer body in turn being carried in an electrically non-conductive spacer frame peripherally enclosing said spacer body and said plate electrodes, said frame having a corresponding pair of opposed end face portions and being of slightly greater transverse thickness than that of said body such that the corresponding end face portion of said frame adjacent the end face portion of said body carrying said cathode plate electrode extends slightly beyond said cathode plate electrode a given transverse distance, preferably with the cathode being a porous, e.g. wire gauze, plate electrode and with a separating wall disposed in the hollow space between the plate electrodes to define a catholyte space adajcent the cathode, e.g. with the porous cathode being covered with a diaphragm in contact with the surface thereof remote from the catholyte space, and preferably with the anode being in the form of an imperforate titanium plate containing a noble metal coating thereon on the side thereof remote from the cathode of the given bipolar electrode, e.g. with the opposite side of the anode having an electrically highly conductive metal coating thereon to enhance the electrical conductivity of the anode and peripherally being in contact with the corresponding spacer body end face portion adjacent thereto and preferably with such connection between the anode and the spacer body being in the form of an electrically highly conductive soldered joint; and electro-chemical cell arrangement for carrying out electrochemical reactions using an aqueous alkali metal halide solution as electrolyte, in the form of an aggregate of internally electrically interconnected cells made up of such bipolar units in side-by-side disposition with appropriate end electrodes and current terminal means to complete the system.

3,778,363

COBALT METATITANATE-MODIFIED SOLID SOLUTION

James M. Kolb, Mentor, and Kevin J. O'Leary, Cleveland Heights, Ohio, assignors to Electronor Corporation, Panama City, Panama

No Drawing. Continuation-in-part of abandoned application Ser. No. 104,743, Jan. 7, 1971. This application Feb. 2, 1972, Ser. No. 222,995

Int. Cl. B01k *3/06*

U.S. Cl. 204—290 F **16 Claims**

A coherent mixture of crystalline cobalt metatitanate with a valve metal oxide-platinum metal oxide solid solution is provided. Typical use of the mixture is as an adherent electrically-conductive electrocatalytically-active coating applied to an electrically-conductive substrate for use as an electrode.

3,778,364

RADIATION PROCESS FOR MAKING PLASTIC PAPER CONTAINING EXPANDABLE, THERMOPLASTIC MICROSPHERES

Inder Mani and George J. Atchison, Midland, Mich., assignors to The Dow Chemical Corporation, Midland, Mich.

No Drawing. Filed Jan. 10, 1972, Ser. No. 216,745

Int. Cl. B01j *1/00, 1/16*

U.S. Cl. 204—159.15 **12 Claims**

A mixture containing a component polymerizable upon exposure to ionizing radiation and expandable thermoplastic microspheres is cast as a film. Preferably the mixture contains an inorganic filler such as calcium carbonate. The microspheres are caused to expand while the film is exposed in an inert atmosphere to a sufficient amount of ionizing radiation to polymerize the mixture. The resultant product is a plastic paper having an excellent writing and printing surface. The polymerizable component comprises hydroxyalkyl acrylate monomer and may also contain minor amounts of a copolymerizable monomer and/or a resin having two or more polymerizable unsaturated groups such as an unsaturated polyester resin.

3,778,365

HYDROCRACKING AND HYDRODENITROGENATION OF SHALE OIL

Glen P. Hamner, Baton Rouge, and Ralph B. Mason, Denham Springs, La., assignors to Esso Research and Engineering Company

No Drawing. Continuation-in-part of abandoned application Ser. No. 735,546, June 10, 1968. This application July 27, 1970, Ser. No. 58,646

Int. Cl. B01j *11/40;* **C01b** *33/28;* **C10g** *13/02*

U.S. Cl. 208—111 **26 Claims**

A process, and nitrogen-bearing bimetallic catalyst, for upgrading heavy hydrocarbon oils by means of catalytic hydrocracking and hydrodenitrogenation. Heavy hydrocarbon oils containing appreciable quantities of nitrogen, particularly shale oils, are subjected to catalytic hydrocracking in the presence of hydrogen and a catalyst, prepared by ammonia activation of a catalyst composite comprising a mixture of nonnoble metals deposited on a suitable cracking base, particularly a crystalline zeolite base. Nitrogen is removed while the oil is selectively converted to lower boiling valuable products.

3,778,366

PROCESS FOR TREATMENT OF AQUEOUS SUSPENSIONS

Kurt A. Kraus, Oak Ridge, Tenn., assignor to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed May 28, 1971, Ser. No. 148,132

Int. Cl. B01d *13/00*

U.S. Cl. 210—23 **3 Claims**

A method of treating aqueous waste streams for the purpose of removing a soluble or dispersed moiety which comprises passing said stream through a vertically disposed, porous, permeable material which contains a zone of fluidization and a solid fluidizing medium in said zone at a velocity sufficient to affect transpiration of a purified water product through said material.

3,778,367

TREATMENT OF PROCESS WATER

Robert D. Pruessner, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

No Drawing. Filed Sept. 22, 1971, Ser. No. 182,908

Int. Cl. C02b *1/20*

U.S. Cl. 210—51 **18 Claims**

Separation of emulsifiers which are salts of the condensation product of naphthalene sulfonic acid and formaldehyde from process water by contacting the process water with an amine having at least two amine groups separated by an aliphatic radical having no more than 5 carbon atoms with the separation being made at a pH of less than 7.0. For example, polychloroprene is produced by emulsion polymerization using said salts as surfactants with the salts being washed out into process water which is contacted with polyethyleneamine and the pH of mixture lowered to 4.0 to effect separation of said salt.

3,778,368

DISPOSAL OF METAL-CONTAINING WASTE WATER

Yoshiro Nakamura, Morioka, Akira Umehara, Osaka, and Itsuyo Yamada, Kobe, Japan, assignors to Sankyo Kasei Company, Limited, Osaka-shi, Japan

No Drawing. Filed Aug. 14, 1972, Ser. No. 280,352

Claims priority, application Japan, Aug. 18, 1971, 46/63,156

Int. Cl. C02b *1/26;* C02c *5/02*

U.S. Cl. 210—54 **6 Claims**

In treating waste water containing at least one of metal ions having a normal electrode potential of at least −0.440 v. (at 25° C.) to remove the metal ion therefrom, a method which is characterized in that to the waste water is added at least one of mercapto-s-triazines and water-soluble salts thereof.

3,778,369

HEMODIALYZER WITH TAPERED SLIT BLOOD PORTS AND BAFFLES

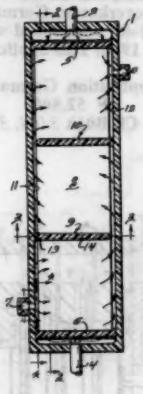
Finley W. Markley, Naperville, Ill., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed Feb. 3, 1972, Ser. No. 223,270

Int. Cl. B01d *31/00*

U.S. Cl. 210—321 **4 Claims**

A new parallel flow hemodialyzer, which provides greater dialysis efficiency and better blood flow distribution, has baffles to direct blood flow and a new type of blood port. Baffles are placed across the width of the tubes from one side wall of the casing forcing the blood to flow around the baffles across the tubes a multiple number of times in passing through the hemodialyzer. The baffles are made from epoxy resin strips placed across the width of each tube. The new blood ports extend across the width of the side of the casing near its ends. The ports have an end adjacent the edge of the casing which defines an opening from the exterior of the hemodialyzer which leads to a tapered slit opening to the interior of the hemodialyzer, this slit tapering to a smaller width as the distance from the exterior opening increases and tapering



to a close at the edge of the casing opposite the exterior opening.

3,778,370

LUBRICATING OIL ADDITIVES AND COMPOSITIONS CONTAINING SUCH ADDITIVES

Brian R. Kennedy, San Rafael, and Louis de Vries, Greenbrae, Calif., assignors to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Nov. 15, 1971, Ser. No. 199,034

Int. Cl. C10m *1/54*

U.S. Cl. 252—42 F **6 Claims**

Esters of 4-hydroxy- and 4-thiol-benzoic acids, dithio, 1,4-dihydro-1-oxo-4-dithiomethylenebenzenes and 1,4-dihydro-1-oxo-4-(dithiacyclopent-2-ylidene)-benzenes in which the hydroxy, thiol and oxo groups are sterically hindered are provided. Also provided are intermediates for such esters and substituted benzenes. In addition, processes are provided for preparing these intermediates for such compounds and processes for preparing such compounds. These compounds and mixtures thereof are useful as additives for lubricating oils providing such oils with high resistance to oxidative change. In addition, oils containing certain of the esters, particular bis-alkylene esters, and certain of the dithiacyclopentylidene benzenes and mixtures thereof demonstrate superior extreme pressure lubricating properties.

3,778,371

LUBRICANT AND FUEL COMPOSITIONS

Robert E. Malec, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

No Drawing. Continuation-in-part of abandoned application Ser. No. 138,758, Apr. 29, 1971. This application May 19, 1972, Ser. No. 255,223

Int. Cl. C10m *1/32;* C10l *1/22*

U.S. Cl. 252—34 **33 Claims**

High molecular weight N-hydrocarbyl-substituted quaternary ammonium salts in which the hydrocarbyl group has a molecular weight of from about 350–3000 such as a polybutene ammonium chloride are effective detergents and dispersants for gasoline and lubricating oils.

3,778,372

LUBRICANTS AND FUELS CONTAINING NITROGEN-BEARING COMPOSITIONS

John P. Murphy, Willoughby, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

No Drawing. Continuation-in-part of abandoned application Ser. No. 773,298, Nov. 4, 1968. This application Dec. 23, 1971, Ser. No. 211,771

Int. Cl. C10l *1/22;* C10m *1/32*

U.S. Cl. 252—51.5 A 22 Claims

This invention is directed to lubricants and fuels comprising nitrogen-containing compositions and more specifically to a process for preparing nitrogen-containing compositions particularly useful as rust-inhibitors for lubricants and fuels. The nitrogen-containing compositions are prepared by reacting effective amounts of at least one alkylene amine with formic acid or a formic acid-producing compound at a temperature of at least about 25° C.

3,778,373

IRON CONTAINING FERROMAGNETIC CHROMIUM OXIDE

Harry Robbins, Los Angeles, Calif., assignor to Bell & Howell Company

No Drawing. Filed Nov. 8, 1971, Ser. No. 196,714

Int. Cl. C01g *37/02*

U.S. Cl. 252—62.56 2 Claims

Ferromagnetic chromium oxide having an intrinsic coercive force above 600 oersteds is prepared by heating an intimate mixture of chromium (III) and iron (III) combined with oxygen with an oxidizing agent. In particular embodiments, the mixture is obtained by co-precipitation of the hydroxides from a solution of chromium (III) and iron (III) salts.

3,778,374

PROCESS FOR PRODUCING FERRITES

Yuzo Shichijo, 12, 2-chome, Seifuso, Toyonaka, Osaka Prefecture, Japan; Gyoichi Asano, 15–30 Segawa, Minoo, Osaka Prefecture, Japan; and Eizo Takama, 233 Koshien, Nishinomiya, Hyogo Prefecture, Japan

Continuation-in-part of application Ser. No. 117,120, Feb. 19, 1971, which is a continuation of application Ser. No. 16,261, Mar. 3, 1970, which is a continuation-in-part of application Ser. No. 656,301, July 5, 1967, which in turn is a continuation-in-part of application Ser. No. 351,754, Mar. 13, 1964, all now abandoned.

This application Dec. 22, 1971, Ser. No. 211,936

Claims priority, application Japan, May 27, 1963, 38/27,338

Int. Cl. C04b *35/38*

U.S. Cl. 252—62.62 2 Claims

A process of producing a spinel-type ferrite having high magnetic permeability and high flux density comprises presintering in air, sintering in a more reducible atmosphere than that of next sintering without depositing any other phase than the spinel-type ferrite one so as to activate reaction, sintering in an equilibrium atmosphere and cooling in an equilibrium atmosphere.

3,778,375

PHOSPHORUS- AND NITROGEN-CONTAINING LUBRICANT ADDITIVES

Milton Braid, Westmont, and David B. Quinty, Willingboro, N.J., assignors to Mobil Oil Corporation

No Drawing. Filed Apr. 17, 1972, Ser. No. 244,937

Int. Cl. C10m *1/36, 1/46*

U.S. Cl. 252—49.9 7 Claims

The addition of an additive made by reacting a phosphonate with oleamide to a lubricant imparts improved frictional characteristics thereto. In addition, levels of corrosion and chatter and squawking noises resulting from interrupted power transmission are eliminated or reduced to acceptable levels.

3,778,376

FUNCTIONAL FLUIDS

John F. Herber, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of abandoned application Ser. No. 562,520, July 5, 1966. This application Dec. 8, 1969, Ser. No. 883,341

Int. Cl. C09k *3/00*

U.S. Cl. 252—78 3 Claims

Functional fluids comprising a major amount of a phosphoramidate and a minor amount of a mixture of (1) a nitrogen-containing antioxidant and (2) a nitrogen-containing heterocyclic compound have greatly reduced corrosiveness to metal mechanical members in contact with said fluids. The fluid compositions are useful as hydraulic fluids, damping fluids, heat transfer fluids and the like.

3,778,377

PROTECTING METAL DURING ACID CONTACT

Herbert D. Clark, Burbank, Calif., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Oct. 6, 1971, Ser. No. 187,120

Int. Cl. C02b *5/06*

U.S. Cl. 252—82 7 Claims

Protecting metal during contact with acid by incorporating an inhibitor mixture of a polyaminomethylenephosphonate and an N,N′-dicycloalkyl-thiourea. The inhibitor mixture is used in descaling, acid cleaning, acid pickling, etc.

3,778,378

SOAP FORMULATION FOR POLISHING ALUMINUM SURFACES

Evandro Antonini, Anzio, Italy, assignor to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed Mar. 20, 1972, Ser. No. 236,455

Claims priority, application Italy, Apr. 5, 1971, 49,547/71

Int. Cl. C11d *17/04*

U.S. Cl. 252—91 4 Claims

Metallic mat scouring pads including a soap formulation containing about from 1 to about 10 percent by weight of pentahydrate borax. The soap formulation can also contain from 8 to about 60 percent saponified fatty acids, from 1 to 8 percent anhydrous sodium carbonate and about 20 to 60 percent water.

3,778,379

FLUOROCARBON DRY CLEANING COMPOSITIONS

Plutarch Constantine Papannou, Carneys Point, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 21, 1972, Ser. No. 219,791

Int. Cl. C11d *7/52*

U.S. Cl. 252—171 11 Claims

Dry cleaning compositions containing 1,1,2-trichloro-1,2,2-trifluoroethane or trichlorofluoromethane, an alkylbenzenesulfonate, for example, isopropylammonium dodecylbenzenesulfonate, an alkyl phosphate, for example, diethanolammonium mixed mono- and di(C_{8-12})alkyl phosphates, and water (optionally), said compositions being especially useful in commercial dry cleaning processes to minimize redeposition of particulate soil and to minimize water damage to the clothing if water is employed in the dry cleaning system.

ERRATUM

For Class 252—301.40 R see:
Patent No. 3,778,234

3,778,380
METHOD FOR PRODUCING UO_2 LOADED REFRACTORY METALS

Richard D. Baker, Sidney W. Hayter, and Homer D. Lewis, Los Alamos, N. Mex., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Oct. 31, 1966, Ser. No. 591,017
Int. Cl. C09k *3/00*
U.S. Cl. 252—301.1 R **9 Claims**

A finely divided dispersion of UO_2 in tungsten or molybdenum is prepared by co-precipitating the metals from mixed aqueous solution with oxine. The co-precipitate thus formed is separated from the solution, dried, calcined, and finally reduced to UO_2 and refractory metal.

3,778,381
FLUOROCARBON MICROEMULSIONS

Henri L. Rosano, Oradell, N.J., and William E. Gerbacia, Bronx, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Apr. 24, 1972, Ser. No. 247,039
Int. Cl. B01j *13/00*
U.S. Cl. 252—311 **23 Claims**

ABSTRACT OF THE DISCLOSURE

Microemulsions of liquid fluorinated organic compounds having more than 4 carbon atoms are prepared by (1) admixing the fluorinated compound with a low boiling fluorohalocarbon which is either miscible with or a solvent for the fluorinated compound, (2) adding this mixture to an aqueous system containing a surfactant while stirring until a microemulsion is formed and (3) removing the fluorohalocarbon by evaporation. The microemulsion so produced are highly stable and are capable of absorbing a large amount of oxygen and carbon dioxide. As such they are useful in the preservation of animal organs.

3,778,382
HYDROPEROXIDE TREATMENT

Richard Bruce Poenisch, League City, and Fernando Francis Birch, La Porte, Tex., assignors to Oxirane Corporation

No Drawing. Filed Nov. 3, 1970, Ser. No. 86,612
Int. Cl. B01d *3/34*; C23f *11/00*
U.S. Cl. 252—326 **11 Claims**

Aqueous tertiary butyl hydroperoxide compositions are treated with a neutral salt or an organic acid to permit sharp and rapid phase separation.

3,778,383
PROCESS FOR THE ENCAPSULATION OF SUBSTANCES WHICH ARE FINELY DISTRIBUTED IN A LIQUID AND CAPSULE COMPOSITIONS PRODUCED THEREBY

Luzius Schibler, Riehen, and Melvin Harris, Arlesheim, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Continuation-in-part of abandoned application Ser. No. 145,030, May 19, 1971. This application Nov. 11, 1971, Ser. No. 197,946
Claims priority, application Switzerland, May 26, 1970, 7,813/70; May 6, 1971, 6,696/71
Int. Cl. B01j *13/02*; B44d *1/02, 1/14*
U.S. Cl. 252—316 **15 Claims**

An encapsulation process is provided wherein the substances to be encapsulated are dispersed in a distribution medium in the presence of a reactive tenside which is capable to form a compound insoluble in the distribution medium. The dispersed reactive tenside is converted to the irreversible, insoluble state forming a primary capsule suspension and then mixed with an aminoplast precondensate solution to form a secondary suspension of capsules having strengthened walls.

The reactive tenside and the aminoplast precondensate also may be added together and converted to the irreversibly insoluble state at the same time.

The capsules are useful to encapsulate most diverse active substances, such as solvents, dyestuffs, pigments or pesticides.

3,778,384
DIAGNOSTIC COMPOSITION FOR THE QUANTITATIVE DETERMINATION OF GLUCOSE

Joseph Francis Dooley, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 203,840, Dec. 1, 1971. This application July 28, 1972, Ser. No. 275,926
Int. Cl. G01n *21/06, 33/16*
U.S. Cl. 252—408 **3 Claims**

An o-toluidine reagent composition containing an arsenic compound for use in the determination of glucose in biological fluids.

3,778,385
COMPOUNDS OF Mo OR W WITH ORGANOMETALS AS OLEFIN REACTION CATALYSTS

Ernest A. Zuech, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Continuation-in-part of application Ser. No. 717,028, Mar. 28, 1968, which is a continuation-in-part of application Ser. No. 635,649, May 3, 1967, both now abandoned. This application Apr. 26, 1971, Ser. No. 137,676
Int. Cl. C07c *3/62*
U.S. Cl. 252—431 C **15 Claims**

A catalyst active for the olefin reaction including olefin disproportionation which comprises a cordination compound of molybdenum or tungsten wherein the metal is complexed with at least one of a carbonyl; trialkyl or triaryl phosphines, arsines or stilbines; or hydrocarboxylic acid ligand combined with an organometallic compound of Groups I–A, II–A, II–B, or III–A.

3,778,386
OXIDATION CATALYST FOR OXIDATION OF OLEFINS TO UNSATURATED ALDEHYDES

Shigeo Takenaka, Yasuji Kido, Tatsutoshi Shimabara, and Masanobu Ogawa, Takasaki, Japan, assignors to Nippon Kayaku Co., Ltd., Tokyo, Japan

No Drawing. Filed Apr. 24, 1970, Ser. No. 31,757
Claims priority, application Japan, May 2, 1969, 44/33,597
Int. Cl. B01j *11/82*
U.S. Cl. 252—432 **4 Claims**

The preparation of an oxidation catalyst is described, represented by the following general formula:

$$Ni_aCo_bFe_cBi_dL_eM_hMo_fO_g$$

in which L is phosphorous, arsenic or boron and M is potassium, rubidium or cesium; and wherein a and b have a value of from 0 to 15, $a+b$ being 2 to 15, c is 0.5 to 7, d is 0.1 to 4, e is 0 to 4, f is 12, g is 35 to 85 and h is 0.01 to 0.5. The oxidation catalyst is useful in a process to produce acrolein by oxidizing propylene in vapor phase.

3,778,387
ACTIVATED CARBON WITH ANTIOXIDANT PROPERTIES AND A METHOD OF PREPARING THE SAME

John Emery Urbanic, Pittsburgh, and Robert Francis Sutt, Coraopolis, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

No Drawing. Filed June 21, 1971, Ser. No. 155,269
Int. Cl. C01b *31/08*
U.S. Cl. 252—428 **5 Claims**

An activated carbon with antioxidant properties is prepared by first acid washing the carbon to remove ash,

then air oxidizing the carbon, and finally impregnating the carbon with a ketone.

3,778,388

CHROMIA-ALUMINA CATALYST

Edward B. Cornelius, Swarthmore, Pa., and David W. Koester, Wilmington, Del., assignors to Air Products and Chemicals, Inc., Philadelphia, Pa.

No Drawing. Original application May 28, 1970, Ser. No. 41,549, now Patent No. 3,665,049. Divided and this application Dec. 13, 1971, Ser. No. 207,672

Int. Cl. B01j *11/06, 11/32*

U.S. Cl. 252—465 **6 Claims**

Triethyl aluminum is employed as reactant in a conversion to valuable products, forming an alumina by-product consisting predominantly of alumina alpha-monohydrate and a significant amount of amorphous alumina. Particles of this by-product are marketed as a technical grade of boehmite. A precursor mixture is prepared comprising calcined alumina powder, a larger amount of said technical grade of boehmite, and an aqueous solution containing ammonium dichromate. Said mixture is extruded, sliced into pellets, calcined in steam, and cooled to provide dehydrogenation catalyst consisting of about 20% chromia and 80% alumina. Propane at subatmospheric pressure is dehydrogenated at a high conversion per pass to provide an attractive yield of propene over said catalyst at 570–680° C. at a space velocity of from about 0.2 to about 5 volumes of liquid propane per volume of catalyst per hour during a commercially acceptable catalyst life.

3,778,389

ELECTRO-CONDUCTIVE MATERIAL CONTAINING PBO AND RuO_2

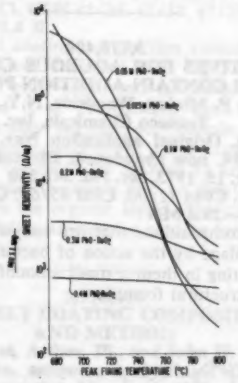
Toru Kasanami and Osamu Kano, Kyoto-fu, Japan, assignors to Murata Manufacturing Co., Ltd., Otokunigun, Kyoto-fu, Japan

Filed Dec. 28, 1970, Ser. No. 101,515

Claims priority, application Japan, Dec. 26, 1969, 44/1,062

Int. Cl. H01b *1/06*

U.S. Cl. 252—520 **25 Claims**



An electro-conductive material essentially consisting of a double oxide obtained from PbO and RuO_2 in a molar ratio of 3:1 to 1:3, which is useful as the fundamental composition for production of a resistor paste, a ceramic resistor or the like.

3,778,390

HYDROLYTICALLY UNSTABLE POLYURETHANE FOAMS

Donald Aloysious Ulrich, Jr., Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed July 17, 1972, Ser. No. 272,594

Int. Cl. C08g *22/10, 22/44*

U.S. Cl. 260—2.5 AN **3 Claims**

Water-disintegratable, sewerage disposable, polyurethane foams wherein the conventional polyol reactant is replaced in whole or in part with a hydrolytically unstable polyester polyol, said foams being especially adapted to use in personal hygienic articles.

3,778,391

PROCESS FOR CONCENTRATING AQUEOUS COLLOIDAL DISPERSIONS OF POLYTETRAFLUOROETHYLENE

Paul S. Morris, Acton, Mass., and Robert H. Hutzler, Chatham, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Feb. 24, 1972, Ser. No. 229,190

Int. Cl. C08d *9/06*

U.S. Cl. 260—17.4 ST **6 Claims**

In the creaming process for concentrating dilute aqueous colloidal dispersions of polytetrafluoroethylene, using as creaming agent naturally-occurring water-soluble colloids, in the presence as stabilizer of non-ionic surface active agent to obtain a concentrated dispersion phase and a supernatant aqueous phase, followed by phase separation, viscosity of the resultant concentrated dispersion is reduced, without concomitant loss in stability, by a process improvement which comprises adding aqueous hydrogen peroxide to the dispersions to be creamed in amount of about 2 to 20 parts by weight per 100 parts of creaming agent.

3,778,392

POLYMERIC STARCH COMPOSITION

John F. Hughes, Montreal, Quebec, Canada, assignor to Cellcor Corporation of Canada Ltd., Montreal, Quebec, Canada

No Drawing. Filed Nov. 23, 1971, Ser. No. 201,312

Int. Cl. C08b *25/02*

U.S. Cl. 260—17.3 **9 Claims**

A novel polymeric starch composition as well as a process for its production is described. The composition is obtained by

(a) reacting a hydrolysed starch with an amino amide or a diamide, e.g. urea,

(b) reacting the product obtained with an olefinic oxide or dioxide, and

(c) reacting the second product with a carbonyl compound, e.g. formaldehyde, to obtain the final product. This product cures under drying conditions to produce a crosslinked resin composition which shows excellent bonding characteristics to many different materials as well as showing excellent strength properties and water resistance.

3,778,393

GELS FOR USE IN GEL CHROMATOGRAPHIC PROCEDURES AND PROCESSES FOR PRODUCING THE SAME

Gerd Greber and Herbert Schott, Freiburg Im Breisgau, Germany, assignors to Papierwerke "Waldhof-Aschaffenburg" AG, Munich, Germany

No Drawing. Filed Jan. 25, 1971, Ser. No. 109,545

Claims priority, application Germany, Jan. 26, 1970, P 20 03 266.0; June 25, 1970, P 20 31 366.0

Int. Cl. A61k *27/12*

U.S. Cl. 260—17.45 G **9 Claims**

Gels having covalent built in nucleic acid groups as an integral part of the gel structure, in which at the least a nucleobase is present which provides the free functional groups required for base coupling or exchange and method of making and using such gels.

3,778,394

POLYMERIC FATTY ACID POLYAMIDE MODIFIED WITH A ROSIN ADDUCT

Roger A. Lovald, Roseville, and David W. Glaser, St. Paul, Minn., assignors to General Mills Chemicals, Inc.

No Drawing. Filed Aug. 24, 1972, Ser. No. 283,457
Int. Cl. C08g *20/00*; C09d *11/08*
U.S. Cl. 260—18 N 4 Claims

A polyamide resin-dicarboxylic acid or anhydride adduct. The dicarboxylic acid or anhydride component is selected from maleic acid, maleic anhydride and fumaric acid. The adducts have unique properties as ink varnish binders.

3,778,395

PRINTING INKS COMPRISING A URALKYD

Gregory J. Huelsman, Wyckoff, and Robert E. Bell and Gerald Edward Rohe, Cincinnati, Ohio, assignors to Borden Inc.

No Drawing. Continuation of application Ser. No. 27,124, Apr. 9, 1970, which is a continuation-in-part of application Ser. No. 664,270, Aug. 30, 1967, both now abandoned. This application Feb. 18, 1972, Ser. No. 227,628
Int. Cl. C09d *3/72, 11/10*
U.S. Cl. 260—22 TN 9 Claims

This invention relates to printing inks drying by oxidative polymerization having a low tack to viscosity ratio comprising a coloring agent and a vehicle in which the vehicle comprises from 10% to 100% of a modified uralkyd, said uralkyd prepared by the sequential steps of making an alkyd prepolymer, said prepolymer being the reaction product of an unsaturated fatty acid or ester thereof, a polyol and a polycarboxylic acid and then reacting the prepolymer with a polyisocyanate.

3,778,396

REINFORCED ELASTOMER COMPOSITIONS

Kunihiko Fujimoto, Masayuki Matsui, Shigeto Kishinami, and Toshio Nishi, Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed May 19, 1971, Ser. No. 144,722
Claims priority, application Japan, May 20, 1970, 45/42,384
Int. Cl. C08d *9/12*; C08f *45/08*
U.S. Cl. 260—27 BB 6 Claims

A new rubber composition comprising rubber reinforced by distributing therein carbon fibers, carbon black and softener in combination respectively in a particular amount. The suitable amounts are 0.02 to 0.10 volume fraction of carbon fibers, 0.05 to 0.25 volume fraction of carbon black and 0.02 to 0.30 volume fraction of softener. Substantially uniformly distributed carbon fibers, carbon black fine particles and further finer softener particles disperse the concentrated strain locally generated in the rubber composition to effectively prevent the sudden deterioration of the rubber article which phenomenon can be observed in some types of rubber. Thus the vulcanized rubbers made of said composition have high resistance to fatigue, elongation, mechanical strength and elasticity in combination which makes them very useful for tires, conveyor belts etc. to be subjected to severe dynamic conditions.

3,778,397

PROCESS FOR PREPARING RUBBERIZED BITUMINOUS PAVING COMPOSITIONS

Charles R. Gannon and George H. Beddoe, Ashland, Ky., assignors to Ashland Oil, Inc., Houston, Tex.

No Drawing. Filed Mar. 24, 1971, Ser. No. 127,802
Int. Cl. C08c *11/68*; C08f *45/52*; C08i *1/02*
U.S. Cl. 260—28.5 AS 15 Claims

Aqueous emulsions of polymer rubber and aqueous emulsions of asphalt are mixed at temperatures slightly above ambient (90–100° F.) and then combined with heated aggregate in a pug mill to formulate a paving composition. Use of this process minimizes depolymerization of the polymer in the final paving composition during mixing.

3,778,398

PARAFFIN WAX COATING COMPOSITIONS

Thomas S. Mestetsky, Easton, Pa., assignor to GAF Corporation, New York, N.Y.

No Drawing. Filed June 8, 1972, Ser. No. 260,856
Int. Cl. C08f *45/52*
U.S. Cl. 260—28.5 R 18 Claims

A copolymer of vinyl ester and vinyl pyrrolidone is incorporated into paraffin wax, alone or in conjunction with the incorporation therein of a copolymer of ethylene and vinyl acetate to provide a blended paraffin wax composition having enhanced scuff resistance and/or grease resistance and/or slip characteristics. The vinyl pyrrolidone content of the copolymer of vinyl ester and said vinyl pyrrolidone is from about 10% to about 70% by weight, based on the total weight of said copolymer. At least about 5% by weight of said copolymer of vinyl ester and vinyl pyrrolidone is employed based on the total weight of said wax composition, the amount of said copolymer employed ranging up to about 75% by weight when said copolymer is employed alone and up to about 50% by weight when said copolymer is employed in conjunction with said copolymer of ethylene and vinyl acetate.

3,778,399

NOVEL EMULSION ADHESIVE COMPOSITIONS OF VINYL ACETATE POLYMERS

Chris T. Fazioli, La Grange Park, Ill., and Julius Sirota, South Plainfield, and Richard A. Weldener, Berkeley Heights, N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 810,792, Mar. 26, 1969. This application May 6, 1971, Ser. No. 141,007
Int. Cl. C08f *45/26*
U.S. Cl. 260—29.6 ME 4 Claims

Novel, high solids, adhesive compositions based on an emulsion of a homo- or copolymer of vinyl acetate are described wherein the continuous phase of the emulsion comprises an essentially non-volatile, water soluble liquid or a mixture of water and an essentially non-volatile, water soluble liquid. The novel adhesive compositions are particularly suited for use in the manufacture of window envelopes whereby a transparent patch, or window, is adhered onto the face of the envelope blank.

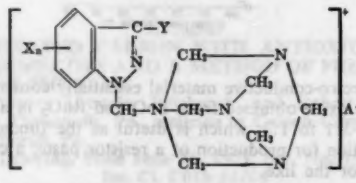
3,778,400

PRESERVATIVES FOR AQUEOUS COMPOSITIONS WHICH CONTAIN ADDITION POLYMERS

Pasquale P. Minieri, Woodside, N.Y., assignor to Tenneco Chemicals, Inc.

No Drawing. Original application Nov. 22, 1971, Ser. No. 201,194, now abandoned. Divided and this application Mar. 15, 1973, Ser. No. 341,560
Int. Cl. C08d *11/00*; C08f *45/64*; C09d *5/14*
U.S. Cl. 260—29.6 MN 9 Claims

Aqueous compositions that are subject to decomposition and spoilage by the action of bacteria are preserved by incorporating in them a small amount of a compound having the structural formula



wherein X represents halogen, nitro, acoylamino, aroylamino (halobenzylidene)amino, or methyleneimino; Y represents hydrogen, halogen, acoylamino, or methyleneimino; A represents halogen; and *n* represents a number in the range of zero to 4. Illustrative of these compounds is N-(3-chloro-6-nitroindazolyl-N' - methyl)hexamethylenetetraammonium chloride.

3,778,401

RESTORING AND/OR PRESERVING PAPERS OR LIKE MATERIALS

Curtis Benjamin Hayworth, Morristown, N.J., assignor to World Patent Development Corp., New York, N.Y.

No Drawing. Filed Jan. 26, 1972, Ser. No. 221,102
Int. Cl. C08f *29/26, 45/24*
U.S. Cl. 260—29.6 ME **20 Claims**

A stable monophasic composition is here taught consisting of a solution of polyvinyl acetals in a solvent mixture consisting of a chlorinated hydrocarbon containing two carbon atoms such as trichloroethylene and basic agents in aqueous solution useful for restoring and preserving papers and similar materials while providing desired basicity.

3,778,402

POLYMERIZATION OF 2-PYRROLIDONE USING A CATALYST FORMED BY REACTION BETWEEN 2-PYRROLIDONE AND AQUEOUS KOH

Tomiaki Kimura, Yasuhiro Ohmura, Tamotsu Yoshimura, Katsuhisa Kohyama, and Kenzo Watanabe, Tokyo, Japan, assignors to Alrac Corporation, Stamford, Conn., and Mitsubishi Chemical Industries Limited, Tokyo, Japan

No Drawing. Filed Dec. 27, 1971, Ser. No. 212,682
Claims priority, application Japan, Dec. 28, 1970, 46/127,185
Int. Cl. C08g *20/18*
U.S. Cl. 260—78 P **4 Claims**

2-pyrrolidone is polymerized using potassium pyrrolidonate having been prepared by reaction between 2-pyrrolidone and an aqueous solution of KOH.

3,778,403

ORGANOSOLS OF AZIRIDINYL ALKYL ACRYLATE OR METHACRYLATE ACRYLIC GRAFT POLYMERS

Aloysius N. Walus, Flint, Mich., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Dec. 22, 1970, Ser. No. 100,795
Int. Cl. C08f *45/28, 45/32, 47/20*
U.S. Cl. 260—31.4 R **3 Claims**

The organosol coating composition consists essentially of a graft copolymer dispersed in an organic liquid. The backbone of the graft copolymer is insoluble in the organic liquid and is of polymerized units of an alkyl methacrylate, an alkyl acrylate, acrylonitrile, methacrylonitrile, styrene or a mixture of these constituents and has grafted into the backbone through an aziridinyl acrylate or methacrylate coupling unit an acrylic side chain that is soluble in the organic liquid. The composition is particularly useful as an exterior coating for automobiles and trucks.

3,778,404

HOT MELT COATING COMPOSITION AND METHOD

Robert N. Henkel, Arthur, Ill., and John H. Kruschinski, Fairfield, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

No Drawing. Filed June 19, 1970, Ser. No. 47,888
Int. Cl. C08f *45/34*
U.S. Cl. 260—33.2 R **6 Claims**

Hot melt extrusion of coatings based on polyethylene or copolymers of ethylene and vinyl acetate, containing as chill roll release agents very small quantities of polyethylene glycol.

3,778,405

PROCESS FOR PREPARING A POLYPHENYLENE LACQUER AND LAMINATES FABRICATED THEREWITH

Norman Bilow, Los Angeles, Calif., assignor to the United States of America as represented by the Secretary of the Air Force

No Drawing. Filed Dec. 30, 1971, Ser. No. 214,462
Int. Cl. C08g *51/30*
U.S. Cl. 260—33.8 R **7 Claims**

A substantially void-free laminate or composite is provided that comprises a reinforcing material coated with a cured copolymer of polyphenylene and a polysulfonyl halide, the copolymer having been prepared by reaction in an alcohol-free chloroform medium and applied to the reinforcing material as a solution in the medium.

3,778,406

PROCESS FOR IMPROVING ADHERENCE OF RUBBER MIXTURES TO TEXTILE FABRICS

Erhard Klötzer, Hanau am Main, and Johannes Pochert, Wessling, near Cologne, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

No Drawing. Continuation of application Ser. No. 845,649, July 9, 1969, which is a continuation of application Ser. No. 620,634, Mar. 6, 1967, both now abandoned. This application Dec. 14, 1970, Ser. No. 98,172
Claims priority, application Germany, Mar. 8, 1966, D 49,530; July 6, 1966, D 50,489
Int. Cl. C08c *11/02, 11/10;* **C08d** *9/10*
U.S. Cl. 260—41.5 A **6 Claims**

Method of improving bond between textiles and rubber vulcanizates obtained by vulcanizing filler containing rubber mixtures and resin forming mixtures of amines or phenols and aldehydes capable of forming resins wherein finely divided active reenforcing silica and/or aluminum silicate and/or calcium silicate and/or calcium carbonate is employed as a filler improving the bond obtained. Further improvement in bond obtained by addition of lead oxide to rubber mixture. Still further improvement obtained by adding resin forming components, particularly, the phenol, in the form of a premix with the filler.

3,778,407

FLAME-PROOF GLASS-FIBER-REINFORCED POLYAMIDE CONTAINING PHOSPHORUS

Willi Hild, Limburgerhof, Franz Zahradnik and Erwin Zahn, Ludwigshafen, and Edmund Priebe, Frankenthal, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Continuation of abandoned application Ser. No. 47,153, June 17, 1970. This application Apr. 24, 1972, Ser. No. 246,770
Claims priority, application Germany, June 20, 1969, P 19 31 387.2
Int. Cl. C08g *51/04, 51/10, 51/56*
U.S. Cl. 260—37 N **5 Claims**

Self-extinguishing glass-fiber-reinforced molding composition based on glass-fiber-reinforced polyamide containing red phosphorus as a flame retardant.

3,778,408

FLAME-RETARDANT, POLYURETHANE COATING COMPOSITIONS

Joseph P. Burns and Joseph Feltzin, Wilmington, Del., and Frank T. Sanderson, Huntington Valley, Pa., assignors to ICI America Inc., Wilmington, Del.

No Drawing. Original application Dec. 9, 1968, Ser. No. 782,484, now Patent No. 3,369,295. Divided and this application Aug. 24, 1970, Ser. No. 66,597
Int. Cl. C08g *22/14, 51/26, 51/58*
U.S. Cl. 260—45.7 P **10 Claims**

Polyurethane coating compositions are provided which, after application to substrates, yield transparent coatings having superior flame-retardancy and resiliency. The coat-

ing compositions comprise a solvent and a polyurethane reaction product of halogen containing polyol, phosphorus containing polyol, and organic polyisocyanate.

3,778,409

ALPHA,ALPHA'-BIS-(2 - HYDROXYPHENYL)-DIISOPROPYL BENZENES AS STABILIZERS FOR POLYURETHANES

Harald Oertel, Odenthal-Globusch, Ernst Roos, Cologne, and Kurt Ley, Odenthal-Globusch, Germany, assignors to Bayer Aktiengeselischaft, Leverkusen, Germany

No Drawing. Filed Mar. 9, 1971, Ser. No. 122,557

Claims priority, application Germany, Mar. 14, 1970, P 20 12 285.4

Int. Cl. C08g *51/58, 51/60*

U.S. Cl. 260—45.8 N **14 Claims**

The invention relates to a process for stabilising polyurethanes, particularly polyurethane elastomer threads and films, against degradation and discoloration under the action of light or UV radiation, oxygen, atmospheric constituents (e.g. nitrogen oxides) and heat by the addition of bisphenols.

3,778,410

PROCESS FOR PREPARING A FINAL COPOLYESTER BY REACTING A STARTING POLYESTER WITH AN ACYLOXY AROMATIC CARBOXYLIC ACID

Herbert F. Kuhfuss and Winston J. Jackson, Jr., Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Sept. 28, 1972, Ser. No. 293,292

Int. Cl. C08g *17/02, 17/14*

U.S. Cl. 260—47 C **8 Claims**

The process of this invention for preparing a final copolyester having an inherent viscosity of at least 0.4 is comprised of two steps. The first step of the process comprises preparing a fragmented polyester by contacting an acyloxy aromatic carboxylic acid with a starting polyester which has an inherent viscosity of at least 0.2 and is formed from a dicarboxylic acid and a diol. The second step comprises increasing the inherent viscosity of the fragmented polyester to at least 0.4 to form the final copolyester. When the starting polyester and acyloxy aromatic carboxylic acid are contacted, acidolysis occurs and there is formed a fragmented polyester composed of low molecular weight polyester molecules. The inherent viscosity of the fragmented polyester is then increased to form the final copolyester comprised of divalent radicals from the dicarboxylic acid portion of the starting polyester, divalent radicals from the diol portion of the starting polyester and divalent radicals remaining after removal of the acyl and hydroxy groups from the acyloxy aromatic carboxylic acid.

3,778,411

POLYAMIDE ACIDS AND POLYAMIDEIMIDES

Carl M. Emerick, Ballston Spa, and Denis R. Pauze, Scotia, N.Y., assignors to General Electric Company

No Drawing. Filed July 30, 1971, Ser. No. 167,837

Int. Cl. C08g *20/32*

U.S. Cl. 260—65 **7 Claims**

New and useful polyamideimides and their precursor polyamic acids are provided. The polyamic acid is prepared by reacting diacid with polyamine material including polymethylene polyaniline and further reacting this reaction product with organic dianhydride and aliphatically unsaturated organic anhydride. The polyamic acid is cured to provide the final polyamideimide.

3,778,412

POLY-as-TRIAZINES

Paul M. Hergenrother, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

No Drawing. Continuation-in-part of application Ser. No. 139,884, May 3, 1971, which is a continuation-in-part of application Ser. No. 846,576, July 31, 1969, both now abandoned. This application Sept. 8, 1972, Ser. No. 287,407

Int. Cl. C08g *9/06*

U.S. Cl. 260—50 **25 Claims**

Disclosed are poly-as-triazines, solutions thereof and processes for preparing same wherein a dihydrazidine and a bis-(1,2-dicarbonyl) compound are reacted in a solvent such as m-cresol, anisole or chloroform. The poly-as-triazines are particularly useful in high temperature adhesive, laminating resins, protective coatings and films.

3,778,413

PROCESS FOR THE PREPARATION OF COPOLYCONDENSATES COMPRISING REACTING PHENOL, A FURFURAL, A UREA AND AN ALIPHATIC ALDEHYDE

Hans Junger, Troisdorf, and Franz Weissenfels, Siegburg, Germany, assignors to Dynamit Nobel Aktiengesellschaft

No Drawing. Filed Dec. 15, 1970, Ser. No. 98,480

Claims priority, application Germany, Dec. 24, 1969, P 19 64 961.7

Int. Cl. C08g *9/10*

U.S. Cl. 260—51.5 **6 Claims**

Production of copolycondensates of 0.1 to 1 mole of a phenol, 0.3 to 1 mole of a urea, 0.1 to 1 mole of a furan and 2 to 4 moles of an aliphatic aldehyde. These polycondensates are prepared by step-wise reaction where no catalyst is used in the first step and alkaline catalysts are used in the second and subsequent stages. The polycondensate product can be cross-linked with a suitable acid catalyst.

3,778,414

RUBBER MIXTURES REINFORCED BY PHENOL NOVOLAC RESINS AND PROCESS FOR PREPARING PHENOL NOVOLAC RESINS SUITABLE THEREFOR

Arnold Giller, Wehen, Taunus, Kurt Hultzsch, Wiesbaden, and Wolfgang Hesse, Wiesbaden-Biebrich, Germany, assignors to Chemische-Werke Albert, Wiesbaden-Biebrich, Germany

No Drawing. Application Nov. 13, 1969, Ser. No. 871,551, now Patent No. 3,586,735, which is a continuation of abandoned application Ser. No. 544,404, Apr. 22, 1966. Divided and this application Mar. 4, 1971, Ser. No. 121,196

Int. Cl. C08g *5/08*

U.S. Cl. 260—51 R **6 Claims**

A phenolic novolac prepared by the acid condensation of a diphenylolalkane with formaldehyde in the presence of an inert organic solvent.

3,778,415

PROCESS FOR PREPARING A MONOALKYL AROMATIC

Daniel Y. C. Ko, Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 13, 1971, Ser. No. 171,541

Int. Cl. C07c *3/62*

U.S. Cl. 260—672 T **10 Claims**

An improvement in a process wherein a first compound and a second compound react with each other to produce a third compound and a fourth compound in essentially irreversible reactions and the second and fourth compounds react with each other to produce the third compound in equilibrium-limited reactions, the second compound being present in the reaction mixture in excess of that required for the reactions, and the excess amount

of the second compound is recycled to the reaction zone, which involves reducing the amount of the second compound in the reaction mixture, introducing therein the fourth compound in an amount greater than would be present at equilibrium and terminating the process before the reaction mixture reaches equilibrium.

3,778,416

PROCESS FOR THE MANUFACTURE OF FILAMENTS AND FIBERS FROM ACRYLONITRILE COPOLYMERS

Robert Zoller, Alterschrofen, Walter Fester, Konigstein, Taunus, Franz Jakob, Hofheim, Taunus, and Alexander Dahmen, Schonberg, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Dec. 29, 1971, Ser. No. 213,822

Claims priority, application Germany, Jan. 7, 1971, P 21 00 450.2

Int. Cl. C08f *15/00, 15/40*

U.S. Cl. 260—78 UA **3 Claims**

The present invention provides a process for the manufacture of filaments and fibers from acrylonitrile copolymers and modacrylic copolymers by copolymerizing acrylonitrile or mixtures thereof with common modifying comonomers with 0.5 to 50% by weight, calculated on the monomer mixture, of N-substituted maleinimides and spinning the copolymers obtained. The filaments and fibers obtained are distinguished by a raised glass transition temperature and hence, an improved dimensional stability at elevated temperature, and by their excellent degree of whiteness.

3,778,417

POLYAMIDE-IMIDE COMPOSITION CONTAINING P-TOLUENE SULFONIC ACID AS STRIPPING AGENT

Carl Serres, Jr., Naperville, and Benjamin A. Bolton, Winfield, Ill., assignors to Standard Oil Company, Chicago, Ill.

No Drawing. Original application Mar. 29, 1971, Ser. No. 129,110, now Patent No. 3,691,136. Divided and this application Apr. 7, 1972, Ser. No. 242,236

Int. Cl. C08g *20/32*

U.S. Cl. 260—78 TF **1 Claim**

Polyamide-imide compositions useful for film preparation are disclosed. These compositions comprise the polyamide-imide polymer, a solvent system for said polymer, and one of the following stripping agents: phosphoric acid, phosphites, esters of phosphoric acid and strong organic acids.

3,778,418

MALEINIZATION PROCESS

Yasuharu Nakayama, 1200 Yahata, Hiratsuka, Japan

No Drawing. Filed Sept. 22, 1971, Ser. No. 182,912

Claims priority, application Japan, Sept. 24, 1970, 45/84,344; Sept. 28, 1970, 45/85,244

Int. Cl. C08c *5/00;* **C08f** *27/00*

U.S. Cl. 260—78.4 D **20 Claims**

In maleinization process in which a maleic anhydride compound is reacted with at least one of unsaturated polymers having ethylenoic double bond in the molecule, unsaturated fatty acids having 8 to 18 carbon atoms and esters of said unsaturated fatty acids to produce a maleinized product, the improvement wherein said reaction is carried out in the presence of at least one of nitrogen-containing compounds selected from the group consisting of ammonia, ammonium salts of saturated fatty acids, monoamine compounds, diamine compounds and amide compounds.

3,778,419

VULCANIZATION PROCESS WITH S,S'-CARBONYL-BIS-DIALKYLDITHIOPHOSPHATE

Rudiger Schubart, Ulrich Eholzer, Theo Kempermann, and Ernst Roos, Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

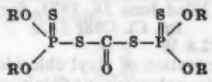
No Drawing. Original application Dec. 21, 1970, Ser. No. 100,361, now Patent No. 3,697,433. Divided and this application Feb. 2, 1972, Ser. No. 222,978

Claims priority, application Germany, Jan. 13, 1970, P 20 01 151.2

Int. Cl. C08d *9/00, 13/28;* **C08f** *27/06*

U.S. Cl. 260—79.5 B **5 Claims**

A process for the vulcanization of terpolymers of ethylene and propylene, also known as EPDM rubbers, is described. More particularly vulcanization accelerators for such a process having the formula



in which the radicals R represent the same or different straight chained or branched lower alkyl radicals, each of which may be substituted by a lower alkoxy group, are described.

3,778,420

COPOLYMERS OF CYCLIC MONOOLEFINS AND CYCLIC POLYOLEFIN COMPOUNDS

James D. Brown and Carl A. Uraneck, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed July 27, 1970, Ser. No. 58,728

Int. Cl. C08f *17/00*

U.S. Cl. 260—80.7 **12 Claims**

Cyclic monoolefins are copolymerized with cyclic polyolefin compounds. Further, copolyomers of cyclic monoolefins, cyclic polyolefins, and acyclic olefins are prepared. The novel polymers produced have improved properties which enables them to be used successfully in various applications.

3,778,421

PROCESS FOR PRODUCING RESINS OF WEATHER RESISTANCE

Hideo Hayashi, Kawasaki, and Hisatake Sato and Akio Oshima, Yokohama, Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed July 16, 1971, Ser. No. 163,177

Claims priority, application Japan, July 22, 1970, 45/63,563

Int. Cl. C08f *15/42*

U.S. Cl. 260—82 **5 Claims**

A process for producing an aromatic hydrocarbon resin having excellent weather resistance and heat resistance which comprises separating a fraction containing a certain amount of conjugated diolefin and indene and indene alkyl derivatives from a hydrocarbon fraction having a boiling point of 140°–220° C. obtained from thermal cracking of petroleum, then adding Friedel-Crafts type catalysts to said fraction, subjecting to polymerization reaction at −30°–+60° C. for 10 minutes to 15 hours, thereafter decomposing and removing said catalyst and separating unreacted oils and low polymers from the reaction products by evaporation or distillation. Additionally, a process for concurrently producing the above-described resin and another aromatic hydrocarbon resin having a softening point of 160° C. or more, the two resins being polymerized products of two different fractions derived from the said hydrocarbon fraction having a boiling point of 140°–220° C., comprising separately polymerizing the said fractions in the manner described above.

3,778,422
PROCESS FOR THE PRODUCTION OF VINYL HALIDE POLYMERS
Elliott Farber, Trenton, and Milton K. Rosen and Ashok C. Shah, Flemington, N.J., assignors to Tenneco Chemicals, Inc.
No Drawing. Filed May 17, 1971, Ser. No. 144,417
Int. Cl. C08f *3/22*
U.S. Cl. 260—92.8 W 10 Claims
The polymerization of vinyl halide is carried out in an aqueous medium in the presence of an organic peroxydicarbonate and a very small amount of an alkyl hydroperoxide.

3,778,423
METHOD FOR REDUCING POLYMER DEPOSIT IN POLYMERIZATION OF VINYL CHLORIDE
William M. Reiter, Mentor, Ohio, assignor to Universal PVC Resins, Inc., Plainesville, Ohio
No Drawing. Filed June 28, 1971, Ser. No. 157,752
Int. Cl. C08f *3/22*
U.S. Cl. 260—92.8 W 4 Claims
In the polymerization of vinyl chloride in the presence of an oil-soluble polymerization initiator, adhesion of vinyl chloride polymer to the interior surface of the polymerization vessel is substantially reduced by coating the surface, prior to polymerization, with a free radical inhibitor.

3,778,424
PROCESS FOR THE PREPARATION OF 1,2-POLYBUTADIENE
Shotaro Sugiura and Haruo Ueno, Chiba, Minoru Kono, Ube, and Hisawaki Hamada, Ichihara, Japan, assignors to Ube Industries Ltd., Yamaguchi-ken, Japan
Filed Dec. 1, 1970, Ser. No. 94,019
Claims priority, application Japan, Dec. 2, 1969, 44/96,253, 44/96,254
Int. Cl. C08d *1/14, 1/34, 3/06*
U.S. Cl. 260—94.3 7 Claims
A process for the preparation of 1,2-polybutadiene which comprises polymerizing 1,3-butadiene in the liquid phase in the presence of a catalyst composition composed of:

(a) a cobalt compound,
(b) an organoaluminum compound of the formula, AlR_3, in which R is a hydrocarbon radical of 1 to 6 carbon atoms, and
(c) carbon disulfide, and optionally
(d) a nitrile compound of the formula,

$$R(CN)_n$$

in which R is an alkyl of 1 to 10 carbon atoms, an aralkyl of 7 to 10 carbon atoms, or an aryl of 6 to 12 carbon atoms, and n is 1 or 2.

Syndiotactic 1,2-polybutadiene obtained from such process has an intrinsic viscosity [η] measured in 135° C. Tetralin of at least 0.3, and a melting point measured with differential scanning calorimeter of at least 200° C.

3,778,425
PROCESS FOR THE MANUFACTURE OF GRANULAR OR POWDERY PURIFIED WHOLE EGG PROTEIN
Makoto Kandatsu and Michio Yamaguchi, Tokyo, Japan, assignors to Tokyo Daigaku, Tokyo, Japan
No Drawing. Filed Oct. 30, 1968, Ser. No. 771,987
Claims priority, application Japan, Oct. 31, 1967, 42/70,091
Int. Cl. A23j *1/08*
U.S. Cl. 260—112 R 9 Claims
A process for producing a purified protein substance obtained from whole eggs by heating a mixture of an alcohol and eggs to dehydrate and defat the eggs and form coagulated protein particles which are then contacted with hot water to remove carbohydrates and inorganic salts, whereafter the water is removed by contact with an organic, dehydrating, solvent and any remaining fat is removed by contact with an organic defatting solvent. The resulting protein substance is dried to form a granular product which may then be crushed to powder form. The product is useful as a protein source in foods, or as an animal feed, or as a food supplement.

3,778,426
THERAPEUTICALLY USEFUL POLYPEPTIDES
Victor A. Najjar, Cohasset, Mass., assignor to Research Corporation, New York, N.Y.
No Drawing. Filed Dec. 16, 1970, Ser. No. 98,890
Int. Cl. C07c *103/52*; C07g *7/00*; C08h *1/00*
U.S. Cl. 260—112.5 14 Claims
Disclosure relates to therapeutically useful polypeptides containing up to about nineteen amino acids, particularly tetrapeptides in which two basic amino acids are joined together through proline. Such compounds exhibit varying degrees of phagocytosis or pinocytosis stimulation or inhibition.

3,778,427
HEXAPEPTIDE
George Rogelio Flouret, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
No Drawing. Filed Nov. 2, 1971, Ser. No. 199,394
Int. Cl. C07c *103/52*
U.S. Cl. 260—112.5 4 Claims
The synthesis of the hexapeptide Tyr-Gly-Leu-Arg-Pro-Gly-amide carrying easily removable protective groups on the Tyr and Arg moieties is described; the correspondingly protected pentapeptide is used as the starting material. The hexapeptide, upon removal of any protective group on the nitrogen of the tyrosine moiety, is an important intermediate for the preparation of the gonadotropin-releasing hormone.

3,778,428
PROCESS FOR THE PRODUCTION OF PEPTIDES
Teruaki Mukaiyama, 145 1-chome, Ogikubo, Suginami-ku; and Massaaki Ueki, 11–2 1-chome, Nishi-Kamata, Ohta-ku, both of Tokyo, Japan; Hiroshi Maruyama, 482 Mori-machi, Isogo-ku, Yokohama, Japan; and Rei Matsueda, % Product Development Laboratories, Sankyo Co., Ltd., 2–58 1-chome, Hiro-machi, Shinagawa-ku; and Kuniaki Gotow, 170–5 4-chome, Nishi Ohkuba, Shinjuku-ku, both of Tokyo, Japan
No Drawing. Continuation of abandoned application Ser. No. 829,741, June 2, 1969. This application Dec. 20, 1971, Ser. No. 210,201
Claims priority, application Japan, Nov. 22, 1968, 43/85,890
Int. Cl. C07c *103/52*; C07g *7/00*; C08h *1/00*
U.S. Cl. 260—112.5 6 Claims
Process for the preparation of a peptide by reacting an aliphatic or aromatic carboxylic acid with an aliphatic or aromatic amine in an organic solvent in the presence of an organometallic compound of mercury and an aromatic disulfide which has a lower alkyl, halogen, phenyl or nitro-substituted phenyl group as a substituent on the sulfur.

3,778,429
METHOD OF SULFATING A TYROSINE MOIETY
Miguel A. Ondetti, North Brunswick, Josip Pluscec, East Brunswick, and John T. Sheehan, Middlesex, N.J., and Johan E. Jorpes, Stockholm, and Viktor Mutt, Farsta, Sweden, assignors to E. R. Squibb & Sons, Inc., New York, N.Y.
No Drawing. Original application May 3, 1968, Ser. No. 726,558. Divided and this application Dec. 23, 1969, Ser. No. 889,770
Int. Cl. C07c *103/52*
U.S. Cl. 260—112.5 10 Claims
Disclosed herein is a method of sulfating the hydroxyl group of an L-tyrosine moiety by treating said moiety with

a mixture of potassium bisulfate and concentrated sulfuric acid.

3,778,430

SILICON SUBSTITUTED AZONITRILES

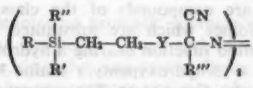
Joel D. Citron, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed May 25, 1971, Ser. No. 146,801

Int. Cl. C07c *107/00*

U.S. Cl. 260—192 8 Claims

Compound of the formula



where R is alkyl, fluoro-substituted alkyl wherein the fluoro substituent is no closer than the gamma position with respect to Si, phenyl, lower alkyl substituted phenyl, fluoro-substituted phenyl, benzyl or lower alkyl substituted benzyl; R′ is a lower alkoxy, aryloxy, alkaryloxy or lower aralkoxy; Y is a saturated lower alkylene; R″ is independent of R and R′ and is any of the above named groups representing R or R′; and R‴ is a lower alkyl, lower alkyl substituted phenyl, benzyl, or lower alkyl substituted benzyl wherein substitution is at other than an alpha position. The compounds find use as free radical initiators in polymerization reactions, and are particularly useful for preparing moisture curable fluorocarbon caulking compounds.

3,778,431

GELATINIZABLE CROSSLINKED CATIONIC STARCH AND METHOD FOR ITS MANUFACTURE

Adrian P. Kightlinger, Edward K. Crosby, and Edwin L. Speakman, Clinton, Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

No Drawing. Filed Oct. 16, 1972, Ser. No. 298,067

Int. Cl. C08b *19/06*

U.S. Cl. 260—233.3 R 13 Claims

A gelatinizable crosslinked cationic starch especially suitable for paper sizing is produced by (1) reacting starch with an alkali-catalyzable crosslinking agent and the reaction product of the crosslinking agent with ammonia or with an amine and (2) depolymerizing the resultant cationic crosslinked product.

3,778,432

ISOCYANATES AND CARBAMATES OF PENICILLINS AND 3-CEPHEM-4-CARBOXYLIC ACIDS

Seemon H. Pines, Murray Hill, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Dec. 13, 1971, Ser. No. 207,624

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C 5 Claims

Preparation of 6-amino-6-methoxy penicillins and 7-amino-7-methoxy-3-cephem-4-carboxylic acid and its esters which are useful as intermediates in the production of the antibiotics 7-acylamido-7-methoxy-3-cephem-4-carboxylic acid and its esters and salts. The products are prepared by removal of the substituted oxycarbonyl group from a 6(or 7)- substituted oxycarbonylamino-6(or 7)-methoxy compound by reduction employing a chemical, catalytic or photochemical method under non-acidic conditions.

3,778,433

PROCESS FOR PRODUCING BENZODIAZEPINE DERIVATIVES

Hisao Yamamoto, Nishinomiya, Shigeho Inaba, Takarazuka, Toshiyuki Hirohashi, Ashiya, Michihiro Yamamoto, Toyonaka, Kikuo Ishizumi, Minoo, Mitsuhiro Akatsu, Ikeda, Isamu Maruyama, Minoo, Yoshiharu Kume, Takarazuka, Kazuo Mori, Kobe, and Takahiro Izumi, Takarazuka, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

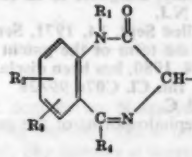
No Drawing. Filed Apr. 7, 1970, Ser. No. 26,409

Claims priority, application Japan, Apr. 18, 1969, 44/30,601, 44/30,603, 44/30,606; Apr. 24, 1969, 44/32,220; May 28, 1969, 44/41,873; May 29, 1969, 44/42,213; July 3, 1969, 44/52,868

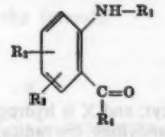
Int. Cl. C07d *53/06*

U.S. Cl. 260—239.3 D 6 Claims

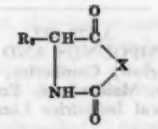
A novel process for producing benzodiazepine derivatives, which have prominent effects as tranquilizer, muscle relaxant, antispasmodic, anticonvulsant and hypnotic, represented by the formula,



wherein R_1 represents hydrogen, alkyl, alkenyl, alkynyl, haloalkyl, trifluoroalkyl, cyanoalkyl, cycloalkylalkyl, alkoxyalkyl, alkylthioalkyl, alkenyloxyalkyl, carbamoylalkyl, alkylcarbamoylalkyl, acyloxyalkyl, alkylcarbonylalkyl, phenylalkyl, substituted phenylalkyl, unsubstituted or substituted aminoalkyl or substituted carbamoylalkyl; R_2 represents hydrogen, halogen, alkyl, nitro cyano, trifluoromethyl, trifluoromethoxy, dialkylamino, piperidino, alkoxy, alkylthio, alkylsulfonyl, alkylsulfinyl, carbamoyl or sulfamoyl; R_3 represents hydrogen, nitro, alkyl or halogen; R_4 represents alkyl, cycloalkyl, cycloalkenyl, unsubstituted or substituted phenyl, phenylalkyl or heterocycle; R_5 represents hydrogen, alkyl, alkoxyalkyl, alkylthioalkyl, phenyl, halogenated or alkoxylated phenyl, or benzyl. These benzodiazepine derivatives are produced by reacting an aminophenyl ketone derivative represented by the formula,



wherein R_1, R_2, R_3 and R_4 are as defined above, with an oxazolid-2,5-dione or thiazolid-2,5-dione derivative represented by the formula,



wherein R_5 is as defined above and X represents oxygen or sulfur.

3,778,434

9 ALPHA, 11-DIMETHYL-SUBSTITUTED STEROIDS

Robert V. Coombs, Chatham, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Apr. 20, 1972, Ser. No. 245,968

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 C 27 Claims

The compounds are 9α,11-dimethyl-substituted steroids of the estrane-type, e.g. 9α,11-dimethyl-17α-ethynylestra-

4-en-17β-ol-3-one. The compounds are useful as pharmaceuticals.

3,778,435

MOLECULAR COMPLEXES OF A BIS-(5-NITROFURFURYLIDENE)-ACETONEGUANYLHYDRAZONE COMPOUND AND AN AMINE

Jacobus Nooi, Baarn, Netherlands, assignor to Heterochemical Corporation, Valley Stream, N.Y.

No Drawing. Filed Nov. 6, 1970, Ser. No. 87,632
Int. Cl. C07d *5/30, 51/38*
U.S. Cl. 260—240 A **5 Claims**

Novel molecular complexes of a bis-(5-nitrofurfurylidene)-acetoneguanylhydrazone compound and an amine and feed additive premixes and feed compositions containing these complexes.

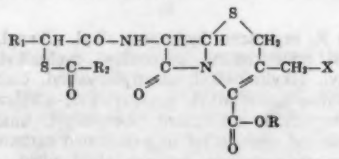
3,778,436

ACYLTHIOACETYL CEPHALOSPORINS

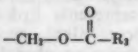
Uwe Treuner, Regensburg, and Hermann Breuer, Burgweinting, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

No Drawing. Filed Sept. 14, 1971, Ser. No. 180,490
The portion of the term of the patent subsequent to July 24, 1980, has been disclaimed
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 C **8 Claims**

Acylthioacetylcephalosporins of the general formula



wherein R is hydrogen, lower alkyl, aralkyl, tri(lower alkyl)silyl, a salt forming ion, or the group



R_1 is hydrogen, lower alkyl, cycloalkyl, aralkyl, aryl or certain heterocyclic groups; R_2 is lower alkyl, cycloalkyl, aryl or certain heterocyclic groups; R_3 is lower alkyl, aryl or aralkyl; and X is hydrogen, hydroxy, lower alkanoyloxy, aralkanoyloxy, the radical of a nitrogen base, a quaternary ammonium radical, or together X and R represent a bond linking carbon and oxygen in a lactone ring; are useful as antibacterial agents.

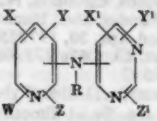
3,778,437

CHEMICAL COMPOUNDS AND COMPOSITIONS

Charles Brian Barlow, Camberley, and Clive Dudley Spencer Tomlin, Maidenhead, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Aug. 20, 1971, Ser. No. 173,629
Claims priority, application Great Britain, Sept. 3, 1970, 42,222/70
Int. Cl. C07d *57/12*
U.S. Cl. 260—256.4 N **4 Claims**

Compounds having the formula:



wherein R represents an atom of hydrogen, an unsubstituted or substituted hydrocarbon group or an acyl group; W, X, X^1, Y, Y^1, Z and Z^1 represent atoms of hydrogen or halogen, provided that at least four of W, X, X^1, Y, Y^1, Z and Z^1 are atoms of halogen. These compounds are useful for combatting pests.

3,778,438

4-AMINO-ISOXAZOLO[5,4-d]PYRIMIDINES AND NITRATES THEREOF

William R. J. Simpson, Mendham, N.J., assignor to Sandoz-Wander Inc., Hanover, N.J.

No Drawing. Filed May 30, 1972, Ser. No. 257,678
Int. Cl. C07d *51/46*
U.S. Cl. 260—256.4 F **12 Claims**

Disclosed are compounds of the class of isoxazolo [5,4-d]pyrimidines which are substituted at the 4-position by an amino function bearing a hydroxyalkyl nitrate moiety, e.g., 4-(5-hydroxypentyl) amino-3-methyl-isoxazolo[5,4-d]pyrimidine nitrate. The compounds have pharmacological activity in animals and are useful, for example, as antianginal agents and in the treatment of shock. Also disclosed are the corresponding hydroxy intermediates useful in preparation of the nitrates and also useful as anti-anginal agents and in the treatment of shock.

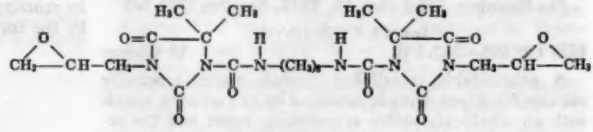
3,778,439

BINUCLEAR N-HETEROCYCLIC POLYGLYCIDYL COMPOUNDS

Juergen Habermeier, Alemannenweg 12, Pfeffingen, Basel, Switzerland, and Daniel Porret, Zelgerweg 37, Binningen, Switzerland

No Drawing. Filed Oct. 28, 1971, Ser. No. 193,559
Claims priority, application Switzerland, Nov. 2, 1970, 16,201/70
Int. Cl. C07d *49/32, 51/18*
U.S. Cl. 260—256.4 C **7 Claims**

Polyglycidyl compounds are manufactured by reacting adducts of 1 mol of a diisocyanate and 2 mols of a hydantoin or dihydrouracil, for example N,N'-bis-(5,5-dimethylhydantoin-1-carbonyl) - hexamethylenediamine, with an epihalogenohydrin or β-methylepihalogenohydrin, for example epichlorohydrin, in the presence of a catalyst. Example: the new compound of the formula



The new polyglycidyl compounds can be converted, by means of the customary curing agents for epoxide resins, such as dicarboxylic acids or polyamines, into mouldings having good mechanical and dielectric properties.

3,778,440

1-SUBSTITUTED AMINO-ISOQUINOLINES AND NITRATES THEREOF

William R. J. Simpson, Hanover, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Dec. 7, 1970, Ser. No. 95,989
Int. Cl. C07d *35/36, 51/70*
U.S. Cl. 260—288 R **8 Claims**

Disclosed are compounds of the class of isoquinolines substituted at the 1-position by an amino function bearing a hydroxy-alkyl nitrate moiety, e.g., 1-(5-hydroxypentyl)-amino-6,7-methylene-dioxyisoquinoline nitrate. The compounds have various pharmacological activities in animals and are useful, for example, as anti-hypertensive agents, anti-anginal agents and in the treatment of shock. Also disclosed are the corresponding hydroxy intermediates which are useful in preparation of the nitrates and also as hypotensive agents or as agents in the treatment of shock.

3,778,441

IODOETHYNYL PYRIDINE COMPOUNDS

Urs Burckhardt, Basel, and Markus Zimmermann, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Feb. 24, 1972, Ser. No. 229,173

Claims priority, application Switzerland, Mar. 5, 1971, 3,203/71

Int. Cl. C07d *31/24*

U.S. Cl. 260—290 4 Claims

Iodoethynyl compounds of the formula

$$R—C\equiv C—I$$

in which R denotes an aromatic six-membered ring containing 1, 2 or 3 nitrogen atoms, and which may have a fused benzene ring, the ring system being unsubstituted or substituted by one or more radicals, which may be the same or different, selected from lower alkyl, lower alkoxy, lower alkylthio, trifluoromethyl and amino groups and halogen atoms and their acid addition salts have useful antimicrobial activities; compositions containing such compounds and methods for protecting against microbial attack are provided; an illustrative embodiment is 2-methoxy-4-iodoethynylpyrimidine.

3,778,442

HETEROCYCLIC AMINE ESTERS OF 2-PHENYL-CYCLOHEXEN-3-CARBOXYLIC ACID

Luigi Turbanti, Via B. da Padule 10, Pisa, Italy

No Drawing. Original application Oct. 2, 1968, Ser. No. 766,029, now Patent No. 3,699,109, dated Oct. 17, 1972. Divided and this application June 15, 1972, Ser. No. 262,985

Claims priority, application Italy, Oct. 7, 1967, 21,367/67

Int. Cl. C07d *87/36*

U.S. Cl. 260—247.2 B 1 Claim

This invention relates to alkylamine and heterocyclic amine esters of 2-phenyl-cyclohexen-3-carboxylic acid as well as physiologically acceptable salts thereof. These new compounds have been found to have antispastic and antiulcer action. The invention also relates to the production of these compounds.

3,778,443

4-TETRAHYDRO PYRIDYL, HYDROXY ALKYL PYRAZOLES

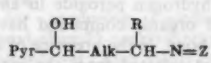
Vishwa Prakash Arya, Bombay, India, assignor to Ciba-Geigy AG

No Drawing. Original application Feb. 13, 1969, Ser. No. 705,013, now Patent No. 3,652,573. Divided and this application Sept. 21, 1971, Ser. No. 182,555

Int. Cl. C07d *31/48*

U.S. Cl. 260—294.8 R 6 Claims

The compounds of the formula



in which N=Z denotes an N-azacycloaliphatic residue containing 5–8 ring members and at most one carbon-carbon double bond, Pyr denotes a 4-pyrazolyl residue optionally substituted in 1-position by lower alkyl or hydroxy-lower alkyl, Alk represents a 1:1-lower alklidene residue, and R denotes a hydrogen atom or a lower alkyl group, or salts thereof have antihypertensive, as well as antitussive or anti-inflammatory properties.

3,778,444

1-PHENYL, 4-ALKANOYL PYRAZOLES

Vishwa Prakash Arya, Bombay, India, assignor to Ciba-Geigy AG

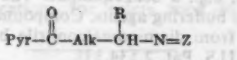
No Drawing. Original application Feb. 13, 1968, Ser. No. 705,013, now Patent No. 3,652,573. Divided and this application Sept. 21, 1971, Ser. No. 182,511

Claims priority, application Switzerland, Mar. 1, 1967, 2,975/67; Jan. 24, 1968, 1,061/68

Int. Cl. C07d *31/48*

U.S. Cl. 260—296 R 10 Claims

The compounds of the formula



in which N=Z denotes an N-azacycloaliphatic residue containing 5–8 ring members and at most one carbon-carbon double bond, Pyr denotes a 4-pyrazolyl residue substituted in 1-position by an optionally substituted phenyl group, Alk represents a 1:1-lower alkylidene residue, and R denotes a hydrogen atom or a lower alkyl group, or salts thereof have antihypertensive, as well as antitussive or anti-inflammatory properties.

3,778,445

PHENOXYALKYLOXAZOLINES

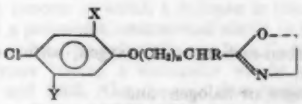
Richard J. Timmons and William E. Gallant, Marysville, Ohio, assignors to The O. M. Scott & Sons Company, Marysville, Ohio

No Drawing. Filed June 28, 1971, Ser. No. 157,711

Int. Cl. C07d *85/36*

U.S. Cl. 260—307 F 3 Claims

Compounds of the formula



where X is hydrogen, chlorine, or methyl; Y is hydrogen or chlorine, *n* is 0 or 2; and R is hydrogen or methyl when *n* is 0 and hydrogen when *n* is 2. Examples of compounds with the foregoing formula are:

2-(2,4-dichlorophenoxymethyl)-2-oxazoline
2-[3-(2,4-dichlorophenoxy)propyl]-2-oxazoline
2-[1-(2,4,5-trichlorophenoxy)ethyl]-2-oxazoline
2-[1-(2-methyl-4-chlorophenoxy)ethyl]-2-oxazoline
2-(2-methyl-4-chlorophenoxymethyl)-2-oxazoline
2-(4-(chlorophenoxymethyl)-2-oxazoline.

Also disclosed are methods of preparing compounds with the foregoing structural formula, methods of using such compounds as herbicides and as growth regulators, and herbicidal and growth regulator formulations including such compounds.

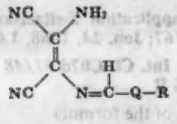
3,778,446

2-SUBSTITUTED - 4,5-DICYANOIMIDAZOLES AND THEIR PREPARATION FROM DIAMINOMALEONITRILE

Frank J. Weigert, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed July 23, 1971, Ser. No. 165,747
Int. Cl. C07d 49/36
U.S. Cl. 260—309 15 Claims

Described are 2-substituted-4,5-dicyanoimidazoles, e.g., 2-ethoxy-4,5-dicyanoimidazole, and their preparation by heating a Compound III of the formula



where Q is O or S and R is hydrocarbyl, in an oxidizing medium, e.g., a benzoquinone. The new compounds are useful as buffering agents. Compound III may be prepared, e.g., from diaminomaleonitrile by the method of Woodward, U.S. Pat. 2,534,331.

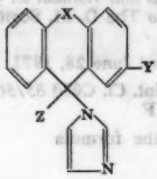
3,778,447

N-[SUBSTITUTED]FLUORENE-, DIBENZOCYCLOHEPTANE- AND DIBENZOCYCLOHEPTENE-IMIDAZOLES

Wilfried Draber, Wuppertal-Elberfeld, Helmut Timmler, Wuppertal-Vohwinkel, and Karl Heinz Buchel and Manfred Plempel, Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Oct. 21, 1971, Ser. No. 191,495
Claims priority, application Germany, Oct. 29, 1970, P 20 53 080.7
Int. Cl. C07d 49/36
U.S. Cl. 260—309 16 Claims

Antimycotic agents of the formula:



wherein

X is a carbon-carbon bond, oxygen, sulfur, ethylene or vinylene;

Y is hydrogen or halogen; and

Z is lower alkyl, lower alkenyl, lower alkynyl or cycloalkyl of 3 to 6 carbon atoms,

are prepared from thionyl-bis-imidazole and the appropriate fused dibenzocarbinol. A typical embodiment is 9-methyl-9-imidazolylfluorene.

3,778,448

MANUFACTURE OF 1,2,3,3-TETRA-SUBSTITUTED INDOLENINIUM SALTS

Hans-Juergen Sturm, Grunstadt, and Claus Tritschler, Heddesheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Sept. 23, 1970, Ser. No. 74,880
Claims priority, application Germany, Sept. 30, 1969, P 19 49 293.4
Int. Cl. C07d 27/56
U.S. Cl. 260—315 7 Claims

Manufacture of 1,2,3,3-tetra-substituted indoleninium salts by reacting a substituted indole with an alkylating agent in the presence of compounds of metals in Group II of the Periodic System. The compounds produced by the process of the invention are valuable intermediates for the manufacture of dyes and pesticides.

3,778,449

INDENOPYRAN- AND INDENOTHIOPYRANALKYLAMINES

Ivo Jirkovsky, Leslie G. Humber, Christopher A. Demerson, and Thomas A. Dobson, Montreal, Quebec, Canada, assignors to Ayerst, McKenna and Harrison Limited, St. Laurent, Quebec, Canada

No Drawing. Filed Oct. 12, 1972, Ser. No. 297,129
Int. Cl. A61k 27/00; C07d 65/04, 7/18
U.S. Cl. 260—327 TH 9 Claims

Indenopyran- and indenothiopyranalkylamine derivatives characterized by having an amino(lower)alkyl radical attached to the 1 position of a indeno[2,1-c]pyran or indeno[2,1-c]thiopyran nucleus are disclosed. The amino portion of the amino(lower)alkyl radical may be further substituted with one or two lower alkyl groups or incorporated into a heterocyclic amine radical. The derivatives are further substituted at position 1 and may be optionally substituted at positions 3, 4, 5, 6, 7, 8, and 9. The indenopyran- and indenothiopyranalkylamine derivatives of this invention are useful antidepressant agents. Methods for their preparation and use are disclosed.

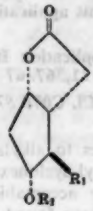
3,778,450

CERTAIN BICYCLIC LACTONES

Udo F. Axen, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Mar. 23, 1971, Ser. No. 127,346
Int. Cl. C07d 5/40
U.S. Cl. 260—343.3 6 Claims

Bicyclic lactone compounds of the formula



(I)

wherein R_1 is methylol or carboxaldehyde and R_2 is benzoyl, substituted benzoyl, mono-esterified phthaloyl, isophthaloyl, or terephthaloyl, naphthoyl, or substituted naphthoyl. These compounds are useful intermediates in preparing prostaglandins having pharmacological utility.

3,778,451

PROCESS FOR THE MANUFACTURE OF PROPYLENE OXIDE

Michel Poite, Paris, France, assignor to Naphtachimie, Paris, France

No Drawing. Continuation of abandoned application Ser. No. 679,170, Oct. 30, 1967. This application Dec. 7, 1970, Ser. No. 95,956
Int. Cl. C07d 1/08, 1/12
U.S. Cl. 260—348.5 L 2 Claims

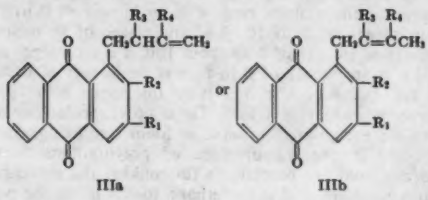
A process for the manufacture of organic epoxides by the reaction of hydrogen peroxide in an organic solvent medium with an organic compound having at least one ethylenic double bond, in the presence of a transition compound of a metal selected from the group consisting of molybdenum, tungsten, vanadium, niobium, tantalum, uranium and rhenium, said compound being soluble in the reaction medium, and in the presence of a nitrogenous organic compound which is soluble in the reaction medium and in which the amount of water present in the reaction medium at the end of the reaction is less than 20% by weight.

3,778,452
1-ALKENYL-9,10-ANTHRAQUINONES

Alden D. Josey and Jack R. Kirchner, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

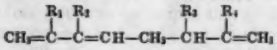
No Drawing. Filed Oct. 9, 1970, Ser. No. 79,642
Int. Cl. C07c *49/68*
U.S. Cl. 260—369 **8 Claims**

There are disclosed certain 1-alkenyl-9,10-anthraquinones of the formula



IIIa IIIb

wherein each of R_1 and R_4 is an alkyl group, or either is an alkyl group and the other is hydrogen; and each of R_2 and R_3 is an alkyl group or hydrogen, provided that R_2 is always hydrogen when each of R_1 and R_3 is hydrogen, which alkyl group or groups are 1–8 carbon straight chain hydrocarbon alkyl groups. Also disclosed is a method for preparing such substituted anthraquinones of Formula IIIa which involves effecting a Diels-Alder condensation between 1,4-naphthoquinone and an alkyl substituted 1,3,7-octatriene of the formula



wherein R_1, R_2, R_3 and R_4 are as defined above; partially oxidizing the resulting adduct which is a 1,4,4a,9a-tetrahydro-1-alkenylanthraquinone with either cupric acetate, or with oxygen or air in the presence of a weak base to obtain a 1,4-dihydro-1-alkenyl-anthraquinone; and then further oxidizing the latter with oxygen or air in the presence of a strong base such as potassium hydroxide. Alternatively, the adduct from the Diels-Alder condensation can be converted directly to the anthraquinone of Formula IIIa by oxidation with oxygen or air in the presence of a strong base such as potassium hydroxide. Heating the compounds of Formula IIIa in the presence of a strong acid such as p-toluene sulfonic acid rearranges their structure to that of Formula IIIb.

The above 1-alkenyl anthraquinones can be converted to tetrahydro-1-alkylanthraquinones that are outstandingly useful as working intermediates in cyclic reduction-oxidation methods for producing hydrogen peroxide.

3,778,453
1-AMINO - 4 - (4',5'-DILOWER ALKYL-3-SULPHAMOYLPHENYLAMINO)ANTHRAQUINONE-2-SULFONIC ACIDS

Peter Hindermann, Bottmingen, and Hubert Meindl, Riehen, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed Mar. 25, 1968, Ser. No. 715,990
Claims priority, application Switzerland, Apr. 5, 1967, 4,892/67
Int. Cl. C07c *143/56;* **C09b** *1/34*
U.S. Cl. 260—374 **5 Claims**

A process for producing 1-amino-4-(4',5'-di-lower alkyl-3-sulphamoyl-phenyl)-amino anthraquinones is described which affords very high yields of these novel dyestuffs free from by-products and involves the reaction of a 1-amino-4 - halogeno-anthraquinone with a 1 - amino-4,5-dialkyl-3-sulphamoyl-benzene. The novel anthraquinones which preferably bear a sulphonic acid group in 2-position at the anthraquinone nucleus are practically free from isomers having a sulphamoyl group in 2- or 6-position at the 4,5-dialkylphenylamino moiety, and dye natural and synthetic polyamide fibres in level vivid, pure blue shades of good fastness properties, especially fastness to light; the brilliance of the shade does not suffer even when observed under artificial light.

3,778,454
COMPLEX ESTER

Joseph P. Kleiman, Birmingham, and Larry Plonsker, Troy, Mich., assignors to Ethyl Corporation, Richmond, Va.

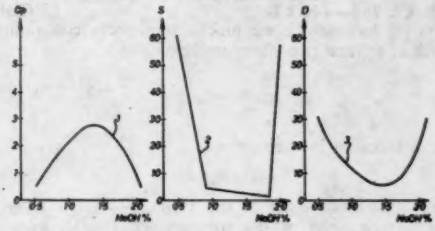
No Drawing. Filed Feb. 18, 1970, Ser. No. 12,466
Int. Cl. C07c *69/44;* **C10m** *1/26, 3/20*
U.S. Cl. 260—404.8 **5 Claims**

A complex ester lubricant is made by reacting a mole of trimethylolpropane with 0.1–0.3 mole of a C_{4-10} aliphatic dicarboxylic acid and esterifying the remaining hydroxyl groups with C_{4-12} aliphatic monocarboxylic acids having an average carbon chain of about 5–9 carbon atoms. The esters have very low pour points and high viscosity indexes. Certain of the esters have physical properties meeting Navy MIL–L–23699–B and Air Force MIL–L–27502 specifications for esters used in jet aircraft engines.

3,778,455
SYNTHETIC CARBOXYLIC ACIDS OF HIGH MOLECULAR WEIGHT

Pierre James Bernard, Mont-Saint-Aignan, France, assignor to Esso Research and Engineering Company, Linden, N.J.

Filed Mar. 26, 1970, Ser. No. 22,814
Claims priority, application France, Mar. 28, 1969, 6909388
Int. Cl. C08h *17/36*
U.S. Cl. 260—413 **5 Claims**



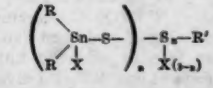
Synthetic carboxylic acids of high molecular weight are made by a process in which a halogen is reacted with a mixture of a polyolefin, unsaturated nitrile (e.g. acrylonitrile), and water. The polyolefin can be a C_2 to C_5 monoolefin polymer having a molecular weight of between about 377 and 3000. Also the acid thus prepared can be used as an anionic emulsifier in a bitumen emulsion.

3,778,456
ORGANO DISTANNTHIANES AND THE PREPARATION THEREOF

Peter Albert Theodore Hoye, Stourbridge, and Donald Albert Wood, Quinton, Birmingham, England, assignors to Albright & Wood Limited, Oldbury, near Birmingham, England

No Drawing. Original application Feb. 24, 1969, Ser. No. 801,825, now Patent No. 3,609,120, dated Sept. 28, 1971. Divided and this application Oct. 16, 1970, Ser. No. 81,546
Int. Cl. C07f *7/22*
U.S. Cl. 260—429.7 **4 Claims**

This invention is one of novel compounds of the formula



wherein R and R' are hydrocarbons, X is a hydrocarbon bonded to a tin atom through a sulfur atom and *n* is an integer of less than 4, and of halogen-containing polymers stabilized against the deteriorative effects of heat by the presence therein of said novel compounds.

3,778,457
CLAY-ARENE COMPLEXES AND PROCESS OF PRODUCING SAME

Max M. Mortland, East Lansing, Mich., and Harvey E. Doner, Lafayette, Calif., assignors to the Board of Trustees of Michigan State University, East Lansing, Mich.

Continuation-in-part of abandoned application Ser. No. 78,126, Oct. 10, 1970. This application May 1, 1972, Ser. No. 249,686
Int. Cl. C07f *1/08, 1/10*
U.S. Cl. 260—430 **12 Claims**

A clay-arene complex characterized by π-bonding of the arene molecule to the clay through a metal ion base exchanged onto the surface of the clay. Such a complex is characterized by an intense color dependent on the particular arene in the complex and the ion on the clay and by an infrared absorption spectrum totally different from that of the liquid or solid arene and of the physically adsorbed arene.

3,778,458
LACTONE-SILICONE COMPOSITIONS

Edward Lewis Morehouse, New City, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Original application May 3, 1968, Ser. No. 726,588, now abandoned. Divided and this application Mar. 22, 1971, Ser. No. 127,009
Int. Cl. C07f *7/02, 7/18*
U.S. Cl. 260—448.2 B **18 Claims**

Novel lactone-silicone block copolymers containing a block of at least two siloxy units:

$$R_4SiO_{\frac{4-d}{2}}$$

and a block of lactone units,

$$-[CR'_2]_aCOO-$$

with or without units of the formula —DO— such as oxyalkylene units of the formula, $\dagger C_aH_{2a}O\dagger$, such copolymers being exemplified by polycaprolactone siloxanes containing the siloxy unit:

$$\left[R'O([CR'_2]_aCOO)_x(C_aH_{2a}O)_b(OC)_cR'''\right]_y R_zSiO_{\frac{4-x-y}{2}}$$

and novel polycaprolactone silanes having the formula:

$$[R'O([CR'_2]_aCOO)_x(C_aH_{2a}O)_b(OC)_cR'''],SiR^\circ_{4-s}$$

wherein R is selected from the class consisting of hydrogen, a monovalent hydrocarbon group free of aliphatic unsaturation and having 1 to 18 carbon atoms, and a divalent organic, preferably hydrocarbon, connecting group free of aliphatic unsaturation and having 2 to 18, preferably 2 to 12, carbon atoms bonded to silicon by a linkage selected from the class consisting of silicon to carbon bonds and silicon to oxygen to carbon bonds, at least one R being a divalent organic connecting group interconnecting a silicone block with a lactone block, R' is selected from the class consisting of hydrogen, a monovalent hydrocarbon group free of aliphatic unsaturation and having 1 to 18 carbon atoms, and an acyl group of the formula: R''C(O)— wherein R'' is selected from the class consisting of hydrogen and a monovalent hydrocarbon group free of aliphatic unsaturation and having 1 to 18 carbon atoms, R''' is a divalent hydrocarbon group free of aliphatic unsaturation and having 2 to 18 carbon atoms, (OC) is a carbonyl groups, the group $(OC)_cR'''$ having 3 to 18 carbon atoms, R° is selected from the class consisting of hydrogen, halogen, monovalent hydrocarbon free of aliphatic unsaturation, alkoxy and aryloxy groups and having no more than 18 carbon atoms; R^2 is selected from the class consisting of hydrogen and monovalent hydrocarbon groups free of aliphatic unsaturation and having 1 to 18 carbon atoms, —DO— is a divalent organic group derived from an epoxide by opening of the oxirane ring, *w* is an integer of 0 to 1; *a* is an integer of 2 to 10; *b* is an integer of 0 to about 100; *c* is an integer of 1 to about 100; *d* is an integer of 1 to 3; *g* is an integer of 5 to 6; *x* is an integer of 0 to 2; *y* is an integer of 1 to 3; *z* is an integer of 1 to 4; and $x+y$ is an integer of 1 to 3. These polycaprolactone silicones are exceptionally useful as foam stabilizing agents, especially in the manufacture of polyurethane foams. Also disclosed are procedures for making the polycaprolactone silicones and polyurethane foams using the polycaprolactone silicone materials.

3,778,459
SILYL MALEATES AND POLYSILOXANE MALEATES

Abe Berger and Terry G. Selin, Schenectady, N.Y., assignors to General Electric Company, Waterford, N.Y.

No Drawing. Original application May 17, 1971, Ser. No. 144,306. Divided and this application Dec. 18, 1972, Ser. No. 315,803
Int. Cl. C07f *7/10, 7/18*
U.S. Cl. 260—448.2 N **10 Claims**

Silyl maleates and fumarates and polysiloxane maleates and fumarates useful as glass sizing agents are prepared in accordance with the present invention. The silyl maleates and polysiloxane maleates and fumarates are formed by reacting either the cis- or trans-1,2-biscarbalkoxyethylenes having an unsaturated alkynyl group therein with a hydrogen silane or hydrogen polysiloxane in the presence of a platinum catalyst.

3,778,460
HYDROCARBYL-HYDROXYPHENYL DITHIOCARBAMATES AND THEIR USE AS ANTIOXIDANTS

John C. Wollensak and Edward F. Zaweski, Royal Oak, Mich., assignors to Ethyl Corporation, Richmond, Va.

No Drawing. Original application Feb. 27, 1967, Ser. No. 619,004, now Patent No. 3,462,368. Divided and this application Jan. 2, 1969, Ser. No. 816,851
Int. Cl. C07c *155/08*
U.S. Cl. 260—455 A **6 Claims**

Hydrocarbyl - hydroxyphenyl - dihydrocarbyldithiocarbamates are prepared by the reaction of dihydrocarbyl halophenols with a metal salt of a dihydrocarbylthiocarbamate. For example, the reaction of 2,6-di-tert-butyl-4-bromophenol with the sodium salt of dimethyldithiocarbamate yields 3,5-di-tert-butyl-4-hydroxyphenyl dimethyldithiocarbamate. The compounds are useful as antioxidants. Effectiveness is enhanced by dihydrocarbyl thiodialkanoates and organic phosphites or phosphonates.

3,778,461
BICYCLOHEPTENE DERIVATIVES

Edward Douglas Brown and Timothy John Leeney, Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Mar. 30, 1972, Ser. No. 239,770
Claims priority, application Great Britain, Apr. 13, 1971, 9,223/71
Int. Cl. C07c *121/48*
U.S. Cl. 260—464 **4 Claims**

The disclosure relates to novel bicycloheptene-7-syn-carbaldehydes, a process for their manufacture and their use in the manufacture of prostaglandins and prostaglandin-like compounds.

3,778,462

OLEFIN HYDROCYANATION REACTION

Brian W. Taylor, Richland Township, Allegheny County, and Harold E. Swift, Gibsonia, Allegheny County, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed June 7, 1971, Ser. No. 150,784
Int. Cl. C07c *121/04*
U.S. Cl. 260—465.3 9 Claims

Hydrocyanation of a non-conjugated olefin such as hexene-1 occurs in the presence of a catalyst system comprising a zero valent nickel complex, free of carbon monoxide, and a promoting amount of a cation of a metal such as zinc chloride using as a solvent an aryl hydrocarbon containing at least one hydroxyl group directly connected to a ring carbon atom such as para-cresol.

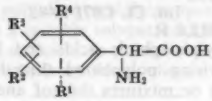
3,778,463

AROMATIC α-AMINO ACIDS

Salo Schmul Gronowitz and Uri Michael, Lund, and Berndt Olof Harald Sjoberg, Sodertalje, Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

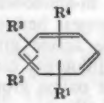
No Drawing. Filed Apr. 29, 1971, Ser. No. 138,747
Claims priority, application Sweden, May 4, 1970, 6,120/70
Int. Cl. C07c *10/06*
U.S. Cl. 260—471 A 10 Claims

A method for preparing amino acids of the formula



(I)

wherein R^1, R^2, R^3 and R^4 are located in positions 2, 3, 4, 5 or 6 on the benzene ring and are the same or different and selected from the class consisting of hydrogen, hydroxy, alkoxy having 1 to 3 carbon atoms, alkyl having 1 to 3 carbon atoms and halogen, provided that at least one of R^1, R^2, R^3 and R^4 are selected from the class consisting of hydroxy, alkyl and alkoxy, by reacting a compound of the formula

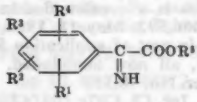


(II)

with

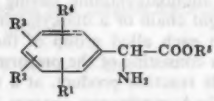
CN—COOR^5 (III)

wherein R^5 is selected from the group consisting of alkyl having 1–4 carbon atoms monocarbocyclic aryl and dicarbocyclic aryl to obtain a compound of the formula



(IV)

and reducing to form a compound of the formula



(V)

and hydrolyzing to obtain compound I.

3,778,464

SUBSTITUTED HYDROXYLAMINE ANTI-OXIDANTS

Peter Klemchuk, 148 Upland Road, Yorktown Heights, N.Y. 10598

No Drawing. Original application Apr. 13, 1971, Ser. No. 133,700, now abandoned. Divided and this application Oct. 10, 1972, Ser. No. 296,450
Int. Cl. C07c *101/00*
U.S. Cl. 260—482 P 1 Claim

Substituted hydroxylamines exhibit activity as anti-oxidants for a diverse group of substrate materials under specific conditions of exposure to an oxidizing environment. Illustrative embodiments of substituted hydroxylamine anti-oxidants are bis(p-nitrobenzyl)hydroxylamine and 2 - diethylamino-4,6-bis(N-n-propyl-N-hydroxyamino)-s-triazine.

3,778,465

PROCESS FOR THE PRODUCTION OF HYDROXY-FATTY ACID ESTERS

Joachim Barnstorf, Dusseldorf-Holthausen, Germany, assignor to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

No Drawing. Filed Apr. 27, 1971, Ser. No. 137,968
Claims priority, application Germany, May 2, 1970, P 20 21 530.9
Int. Cl. C07c *67/00, 69/66;* C11c *3/00*
U.S. Cl. 260—409 10 Claims

A process for the production of hydroxy-fatty acid esters comprising hydrogenating epoxidized fatty acid esters with hydrogen in the presence of heavy metal catalysts of the 8th Group of the Periodic Table at temperatures between 100° C. and 250° C. and a hydrogen pressure of at least 50 atmospheres and recovering said hydroxy-fatty acid esters.

3,778,466

METHOD FOR MANUFACTURE OF 3-PENTENOIC ACID ESTER

Akio Matsuda, Kashiwa, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

No Drawing. Filed Apr. 5, 1972, Ser. No. 241,452
Claims priority, application Japan, June 18, 1971, 46/43,323
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 AC 4 Claims

An ester of 3-pentenoic acid is produced by allowing butadiene, carbon monoxide and an alcohol to react in isoquinoline as the solvent in the presence of cobalt carbonyl as the catalyst. Isoquinoline has low toxicity, a high boiling point and a low solubility with respect to paraffins. Thus, it proves to be a convenient solvent in the distillation and extraction treatments needed for the isolation of the 3-pentenoic acid ester from the reaction mixture. The catalyst and the solvent both can be used cyclically in the present operation.

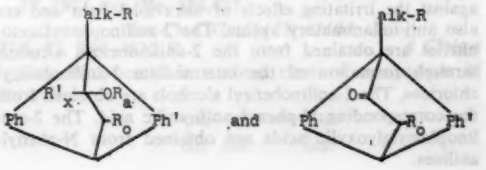
3,778,467

AMINOALKYL-ETHANOANTHRACENES

Max Wilhelm, Allschwil, and Walter Riess, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Apr. 29, 1969, Ser. No. 820,319
Claims priority, application Switzerland, May 16, 1968, 7,284/68; Mar. 25, 1969, 4,480/69
Int. Cl. C07c *91/00, 93/00, 97/10*
U.S. Cl. 260—490 10 Claims

Compounds of the formula



in which

Ph and Ph' are optionally substituted o-phenylene radicals

alk stands for lower alkylene

R stands for an optionally substituted amino group

R_o represents hydrogen or lower alkyl

R'_x represents hydrogen or lower alkyl

R_a represents hydrogen or acyl

are useful as psychopharmaceuticals.

3,778,468

PROCESS FOR PREPARING ETHYLENE GLYCOL ESTERS

John Kollar, Wyckoff, N.J., assignor to Halcon International, Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 819,507, Mar. 24, 1969, now Patent No. 3,689,535, which is a continuation-in-part of abandoned application Ser. No. 763,001, Sept. 26, 1968. This application June 27, 1972, Ser. No. 266,818

Int. Cl. C07c *67/04*

U.S. Cl. 260—497 R **4 Claims**

Ethylene glycol esters are prepared by the molecular oxygen oxidation of ethylene in the presence of a liquid phase reaction medium containing a carboxylic acid, with the reaction being catalyzed by cationic selenium and at least one member of the group consisting of elemental bromine, elemental chlorine, a bromine-containing compound and a chlorine-containing compound.

3,778,469

ISOLATION OF PROSTAGLANDINS FROM *PLEXAURA HOMOMALLA*

Jesse Lee Baker, Emerson, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Nov. 17, 1972, Ser. No. 307,721

Int. Cl. C07c *67/06*

U.S. Cl. 260—499 **6 Claims**

This disclosure describes a multistep process for recovering a prostaglandin enriched isolate from the cortex of the sea coral *Plexaura homomalla*.

3,778,470

CHEMICAL INTERMEDIATES FOR THE PRODUCTION OF SUBSTITUTED 2-ANILINOPHENYLACETIC ACIDS AND ESTERS

Alfred Sallman, Joachimsackerstrasse 12, Bottmingen, Switzerland, and Rudolf Pfister, Newbadstrasse 128, Basel, Switzerland

No Drawing. Application Oct. 2, 1970, Ser. No. 77,763, which is a continuation-in-part of application Ser. No. 861,571, Sept. 29, 1969, which is a continuation-in-part of applications Ser. No. 782,206 and Ser. No. 782,473, both Dec. 9, 1968, and Ser. No. 625,326, Mar. 23, 1967, all now abandoned. Said Ser. No. 782,206, being a continuation-in-part of said applications Ser. No. 625,326 and Ser. No. 539,829, Apr. 4, 1966, now abandoned. Divided and this application Aug. 23, 1972, Ser. No. 283,012

Int. Cl. C07c *101/44*

U.S. Cl. 260—518 R **6 Claims**

Substituted 2-anilinophenylacetonitriles, 2-anilinobenzyl alcohols and 2-anilinophenylglyoxylic acids are valuable chemical intermediates for the preparaiton of substituted 2-anilinophenylacetic acids and esters thereof. The 2-anilinophenylacetic acids and -phenyl-acetates have desirable absorption patterns for protecting the skin against the irritating effects of ultraviolet light and are also anti-inflammatory agents. The 2-anilinophenylacetonitriles are obtained from the 2-anilinobenzyl alcohols through formation of the intermediate 2-anilinobenzyl chlorides. The 2-anilinobenzyl alcohols are obtained from the corresponding N-phenyl anthranilic acid. The 2-anilinophenylglyoxylic acids are obtained from N-phenylanilines.

3,778,471

PROCESS FOR PRODUCING ALIPHATIC CARBOXYLIC ACIDS AND AROMATIC CARBOXYLIC ACIDS

Takeshi Yamahara, Hyogo, and Takashi Deguchi, Osaka, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Dec. 12, 1969, Ser. No. 884,437

Claims priority, application Japan, Aug. 29, 1969, 44/68,854

Int. Cl. C07c *63/02, 63/26*

U.S. Cl. 260—524 R **10 Claims**

A process for the simultaneous production of an aliphatic carboxylic acid and an aromatic carboxylic acid in a high yield by oxidizing an aliphatic secondary alcohol and an alkyl-substituted aromatic hydrocarbon in the liquid phase in an amount of from 0.05 to 1.0 times the weight of said aliphatic secondary alcohol at a temperature of from 100 to 160° C. and at a partial pressure of oxygen of lower than 3 kg./sq. cm. in the presence of a cobalt compound.

3,778,472

PHENOXYPHENYLPHOSPHINIC ACIDS AND IMPROVED POLYPHENYL THIOETHER LUBRICATING COMPOSITIONS

Frank S. Clark, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Original application May 28, 1971, Ser. No. 148,123. Divided and this application Oct. 6, 1972, Ser. No. 296,393

Int. Cl. C07f *9/48*

U.S. Cl. 260—502.4 R **10 Claims**

Phenoxyphenylphosphinic acids and lubricating compositions comprising polyphenyl thioethers, polyphenyl ethers-thioethers or mixtures thereof and small amounts of said acids have improved lubricating properties over wide temperature ranges.

3,778,473

ORGANIC COMPOUNDS AND PROCESS

Gabriel Kornis and Eldon G. Nidy, Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed May 19, 1971, Ser. No. 145,016

Int. Cl. C07c *127/18*

U.S. Cl. 260—553 A **3 Claims**

A number of new m-aminobenzaldoxime derivatives have been found to possess herbicidal and plant growth regulator activity. The amine grouping has been converted into an urea, thiourea, carbamate or thiocarbamate function, and the oxime group has been converted by the formation of O-ethers.

3,778,474

PRODUCTION OF ACETOACETYL AMIDES

August Stocker, Visp, Switzerland, assignor to Lonza Ltd., Gampel/Valais, Basel, Switzerland

Continuation-in-part of application Ser. No. 682,653, Nov. 13, 1967, which is a continuation-in-part of application Ser. No. 366,592, May 11, 1964, which in turn is a continuation-in-part of application Ser. No. 112,215, May 24, 1961, all now abandoned. This application Oct. 6, 1970, Ser. No. 78,358

Int. Cl. C07c *103/42*

U.S. Cl. 260—561 K **9 Claims**

Lower acetoacetyl alkylamides, which have a melting point not exceeding 80° C., may be prepared by reacting diketone with a monoalkylamine having 6 to 15 carbon atoms in a straight chain or a dialkylamine having 2 to 7 carbon atoms in each alkyl group in the presence of a reaction medium consisting of the preformed lower acetoacetyl alkylamide reaction product, at a temperature not exceeding 80° C. A continuous process is shown where there is automatically controlled addition of the alkylamine.

3,778,475

PROCESS FOR THE PREPARATION OF HYDROXAMOYL CHLORIDES

Julius Jakob Fuchs, 1104 Greenway Road, Wilmington, Del. 19803

No Drawing. Continuation-in-part of abandoned application Ser. No. 787,581, Dec. 27, 1968. This application Feb. 14, 1972, Ser. No. 226,219

Int. Cl. C07c *119/18*

U.S. Cl. 260—566 A 2 Claims

Certain α-hydroxyiminoketones are converted to hydroxamoyl chlorides by reaction with a chlorinating agent, such as elemental chlorine, in aqueous medium at a temperature of about −15 to 30° C. The hydroxamoyl chloride obtained in this process are useful intermediates to thiolhydroxamate esters and carbamates having insecticidal properties.

3,778,476

POLYMERIC ORGANIC HALOGEN SALTS

Alan Rembaum and Robert F. Landel, Altadena, and Hendrik Keyzer, Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

No Drawing. Filed May 11, 1970, Ser. No. 36,431

Int. Cl. C07c *87/30;* C08g *33/02, 33/06*

U.S. Cl. 260—567.6 P 14 Claims

Halogen containing polymer salts formed from the reaction of linear polymers containing quaternizable nitrogens dissolved in a suitable solvent, with a halogen source under conditions sufficient to precipitate the halogen containing polymer salts from the solution.

3,778,477

MANUFACTURE OF α,β-UNSATURATED CARBONYL COMPOUNDS

Herbert Mueller, Frankenthal, and Norbert Goetz, Bobenheim-Roxheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Apr. 21, 1971, Ser. No. 136,212

Int. Cl. C07c *45/00*

U.S. Cl. 260—599 12 Claims

A process for the manufacture of α,β-unsaturated carbonyl compounds by contacting the corresponding β,γ-unsaturated alcohols with a dehydrogenation catalyst at temperatures ranging from 150° to 600° C. The reaction proceeds particularly well when carried out in the presence of catalytic amounts of certain nucleophilic substances.

3,778,478

PROCESS FOR PREPARING POLYTHIODIGLYCOL

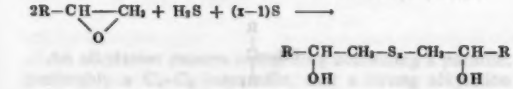
Eugene R. Bertozzi, Yardley, Pa., assignor to Thiokol Chemical Corporation, Bristol, Pa.

No Drawing. Filed May 12, 1972, Ser. No. 252,693

Int. Cl. C07c *149/12*

U.S. Cl. 260—608 6 Claims

A process for preparing polythiodiglycols directly from monoepoxides, H_2S, and sulfur using water or the polythiodiglycol itself as the reaction medium either with or without an inorganic base catalyst according to the following reaction is disclosed.



$$2R-CH(O)CH_2 + H_2S + (x-1)S \longrightarrow R-CH(OH)-CH_2-S_x-CH_2-CH(OH)-R$$

3,778,479

UNSATURATED ALCOHOLS AND DERIVATIVES THEREOF

John J. Morrisroe, Whittier, and Thomas F. Banigan, Arcadia, Calif., assignors to Pilot Chemical Company, Santa Fe Springs, Calif.

No Drawing. Continuation-in-part of abandoned application Ser. No. 687,137, Dec. 1, 1967, which is a continuation-in-part of application Ser. No. 618,824, Feb. 27, 1967, now Patent No. 3,544,603. This application Apr. 19, 1971, Ser. No. 135,428

Int. Cl. C07c *43/00, 43/14*

U.S. Cl. 260—615 B 3 Claims

Linear 3-alken-1-ols of from 11 to 15 carbon atoms are formed by reacting formaldehyde and a linear olefin. Compounds exhibiting desirable detergent properties result from sulfation, ethoxylation, ethoxylation and sulfation, or ethoxylation and dihydroxylation of the 3-alken-1-ols.

3,778,480

PROCESS FOR POLYMERIZATION OF TETRAHYDROFURAN

Kazuo Matsuda, Wakayama, Yoshiaki Tanaka, Osaka, and Takeyo Sakai, Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

No Drawing. Filed Sept. 13, 1971, Ser. No. 180,218

Claims priority, application Japan, Sept. 16, 1970, 45/81,007

Int. Cl. C07c *41/00, 43/02*

U.S. Cl. 260—615 B 5 Claims

Tetrahydrofuran is polymerized in the presence of a catalyst system of 5–50 percent by weight of fuming sulfuric acid, based on the weight of tetrahydrofuran, and 0.01–70 mol percent of fluorine-containing compound, based on the free SO_3 in the fuming sulfuric acid.

3,778,481

PROCESS FOR THE PRODUCTION OF ALKYL DIHYDROXY BENZENES

Efim Biller, Fribourg, Switzerland, Roman Goller, Vienna, Austria, Hellmuth Pflugk, Wesseling, Germany, and Richard Schlegel, Vienna, Austria, assignors to Union Rheinische Braunkohlen Kraftstoff Aktiengesellschaft, Wesseling, near Cologne, Germany

No Drawing. Filed Feb. 13, 1970, Ser. No. 11,342

Claims priority, application Germany, Feb. 17, 1969, P 19 07 879.6

Int. Cl. C07c *37/02*

U.S. Cl. 260—629 4 Claims

Production of alkyl dihydroxy benzenes by reacting an alkyl chloro phenol with caustic potash in suspension in an inert solvent at elevated temperatures, whereby the water formed during the reaction is removed, wholly or in part.

3,778,482

1,3,4-TRIOLS AND DERIVATIVES THEREOF

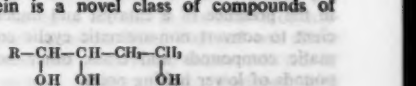
John J. Morrisroe, Whittier, and Thomas F. Banigan, Arcadia, Calif., assignors to Pilot Chemical Company, Santa Fe Springs, Calif.

No Drawing. Continuation-in-part of abandoned application Ser. No. 687,137, Dec. 1, 1967, which is a continuation-in-part of application Ser. No. 618,824, Feb. 27, 1967, now Patent No. 3,544,603. This application Apr. 19, 1971, Ser. No. 135,427

Int. Cl. C07c *31/18, 43/04*

U.S. Cl. 260—635 R 4 Claims

Described herein is a novel class of compounds of formula



where R is a hydrogen or linear alkyl group of from 1 to about 11 carbon atoms. The compounds are prepared by dihydroxylation of a 3-alken-1-ol, e.g., by peroxidation in formic acid to the formate ester which latter is hydrolyzed to the 1,3,4-triol of the invention. The multifunctional compounds can be converted to surfactants, emulsifiers and lubricants, and are useful in the formation of urethanes and alkyd-type resins.

3,778,483

METHODS FOR THE MANUFACTURE OF MACROCYCLIC COMPOUNDS

Joseph J. Becker, Geneva, Karl-Heinrich Schulte-Elte, Chatelaine, Geneva, and Gunther Ohloff, Bernex, Geneva, Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

No Drawing. Original application Dec. 7, 1967, Ser. No. 688,684. Divided and this application June 25, 1971, Ser. No. 156,966

Int. Cl. C07c *13/32*

U.S. Cl. 260—666 PY **2 Claims**

The present invention relates to a new method for the manufacture of macrocyclic compounds, in particular of cyclopentadecanone ("Exaltone"; registered trademark) and a 3-methyl-cyclopentadecan-1-one (muscone). These ketones are odoriferous substances, known per se, which have a musk odor and are indispensable in the perfume industry.

3,778,484

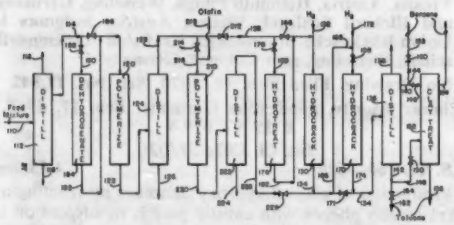
METHOD AND RECOVERY OF BENZENE AND TOLUENE

Stephen M. Kovach, Ashland, and Ralph E. Patrick, Flatwoods, Ky., assignors to Ashland Oil, Inc., Columbus, Ohio

Original application Sept. 28, 1966, Ser. No. 582,652, now abandoned. Divided and this application July 19, 1971, Ser. No. 163,631

Int. Cl. C07c *7/04*

U.S. Cl. 260—674 R **2 Claims**



A method of recovering benzene and toluene from normally liquid hydrocarbon mixtures containing in excess of 50% of benzene and toluene, together with acyclic mono - olefins, acyclic diolefins, cyclo - paraffins, cyclic mono-olefins, cyclic diolefins, and in some cases, sulfur and nitrogen or oxygen compounds, including distilling the mixture to recover a fraction boiling in the benzene-toluene range, subjecting this fraction to a hydrogen treatment in the presence of a catalyst and under conditions to dehydrogenate acyclic diolefins and hydrogenate acyclic mono-olefins, polymerizing the hydrogenation product, if desired, distilling the polymer product to recover a fraction boiling in the benzene-toluene range, subjecting the benzene - toluene fraction to a hydrogen treatment in the presence of a catalyst and under conditions sufficient to convert non-aromatic cyclic compounds to aromatic compounds and crack other non-aromatic compounds of lower boiling point.

3,778,485

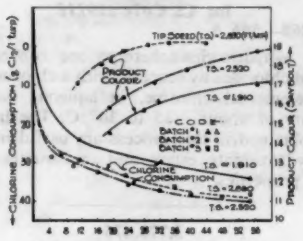
TURPENTINE PURIFICATION PROCESS

Oldrich Prochazka, Ste. Foy, Quebec, Canada, assignor to Anglo Paper Products, Limited, Quebec, Quebec, Canada

Filed Mar. 3, 1972, Ser. No. 231,531

Int. Cl. C09f *3/02*

U.S. Cl. 260—675.5 **6 Claims**



The process of the invention relates to a method of producing solvent grade turpentine by the vigorous agitation of a crude sulfate turpentine, containing malodorous sulfur compounds and/or colored impurities, with an oxidizing hypochlorite solution. This treatment removes the odor-producing sulfur compounds, substantially improves the color of the product, and removes the need for distilling the "light ends." The odor-producing sulfur compounds are converted to water-soluble compounds which are removed in a subsequent washing step in order to prevent the turpentine reverting to its previous malodorous state.

3,778,486

TURPENTINE FRACTION PURIFICATION

Clayton B. Hamby, Jr., Orange Park, Fla., assignor to SCM Corporation, Cleveland, Ohio

Filed Apr. 19, 1972, Ser. No. 245,555

Int. Cl. C07c *13/00, 27/02*

U.S. Cl. 260—675.5 **4 Claims**

Set forth is a process for treating a turpentine hydrocarbon fraction having not substantially more than about 500 parts per million sulfur content with activated carbon for the purpose of removing such sulfur to an essentially negligible quantity. It comprises the steps of feeding a sulfur-laden turpentine fraction to a primary stage containing activated carbon and removing essentially all of the sulfur material in said fraction stage and then regenerating the resulting sulfur-laden carbon in a plurality of steps; the first being done at a temperature sufficient for removing a substantial proportion of adsorbed hydrocarbon compounds without removing substantial sulfur compounds from said carbon and the second being at a temperature sufficient for removing said sulfur compounds without effecting substantial damage to said carbon.

3,778,487

POLYISOBUTYLENE OIL HAVING A HIGH VISCOSITY INDEX

Gary L. Driscoll, Boothwyn, Irl N. Duling, West Chester, and David S. Gates, Swarthmore, Pa., assignors to Sun Research and Development Co., Philadelphia, Pa.

Filed July 6, 1970, Ser. No. 52,301

Int. Cl. C07c *9/00*

U.S. Cl. 260—676 R **14 Claims**

Novel polyolefin oils of monomers of the formula

wherein R is $-CH_3$ and $-C_2H_5$ and R_1 is an alkyl group of from 1 to 10 carbon atoms, have exceptionally high viscosity indices and high coefficients of traction and consists essentially of unisomerized, true oligomer, such as true polyisobutylene oligomers (e.g. $C_{16}H_{32}$, $C_{20}H_{40}$, $C_{24}H_{48}$ . . . $C_{48}H_{96}$). The novel oils are useful as electrical oils, as chemical intermediates or as tractants (i.e. as traction fluids or as components of traction fluids). The hydrogenated oils are novel and especially useful as tractants, particularly when hydrogenated to a bromine number less than 10 (more preferably, less than 5). The unique character of these novel oils, whether olefine and/or paraffin, can be proved by a combination of gas chromatography and nuclear magnetic resonance spectroscopy (NMR). These olefins, and the paraffins produced by hydrogenation thereof are characterized by "crowded" and sterically hindered geminal methyl and isolated methylene groups. The individual species in the range of C_{16} to C_{48} can be separated from the whole oil by vapor phase chromatography. One such novel polyolefin oil having an ASTM viscosity index greater than 85, consists essentially of monoolefins of carbon numbers, C_{24}, C_{28}, C_{32}, C_{36} and C_{40} and having repeating isobutylene structures.

3,778,488

IRON ALLOY CATALYZED OXIDATIVE DEHYDROGENATION

Louis J. Croce, Seabrook, Tex., and Laimonis Bajars, Princeton, N.J., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

No Drawing. Filed Jan. 26, 1970, Ser. No. 5,920
Int. Cl. C07c *5/18*
U.S. Cl. 260—680 E **7 Claims**

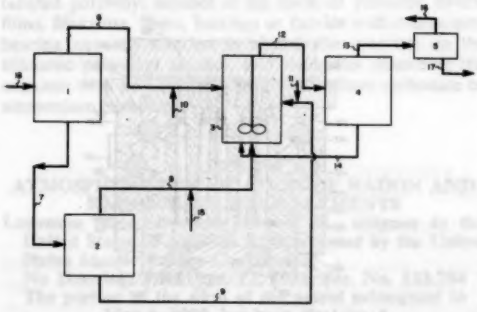
Iron alloys are excellent oxidative dehydrogenation catalysts. They are particularly useful because of their strength and metallic properties. Some of these catalysts can be used to build reactors or reactor liners, others can be prepared as screens or wire or in various other desirable shapes to be used in fixed or moving bed dehydrogenation.

3,778,489

ALKYLATION WITH SEPARATE OLEFIN STREAMS INCLUDING ISOBUTYLENE

Paul T. Parker, Baton Rouge, La., and Ivan Mayer, Summit, N.J., assignors to Esso Research and Engineering Company

Continuation-in-part of abandoned application Ser. No. 99,707, Dec. 18, 1970. This application Dec. 16, 1971, Ser. No. 208,873
Int. Cl. C07c *3/52, 3/54*
U.S. Cl. 260—683.43 **27 Claims**



An alkylation process comprising contacting a paraffin, preferably a C_4–C_6 isoparaffin, and a strong alkylation catalyst in an alkylation zone with a first olefin-containing stream substantially free of isobutylene and 2-methyl-butene-1 and a second olefin-containing stream comprising isobutylene or 2-methyl-butene-1, where the first and second olefin-containing streams are introduced into the alkylation zone at separate points along the zone, the points situated so as to prevent any appreciable mixing of the first and second olefin-containing streams with each other prior to contacting the catalyst and recovering alkylate product of high octane number.

3,778,490

POLAR COMPOUND ADJUVANTS FOR IMPROVED BLOCK POLYMERS PREPARED WITH PRIMARY HYDROCARBYLLITHIUM INITIATORS

Henry L. Hsieh, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Original application Apr. 23, 1969, Ser. No. 818,804, now Patent No. 3,639,521, dated Feb. 1, 1972. Divided and this application June 25, 1971, Ser. No. 156,986
Int. Cl. C08f *19/08*
U.S. Cl. 260—880 B **18 Claims**

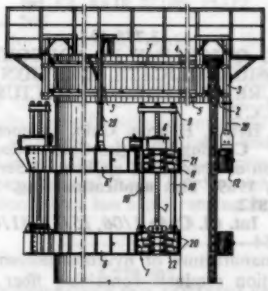
High raw tensile strength radial and linear block polymers are prepared by the incremental addition of monomers employing a particular sequence of addition using primary hydrocarbyllithium initiators with small amounts of polar compound adjuvants, followed by the addition of a polyfunctional treating agent.

3,778,491

METHOD OF ERECTING MONOLITHIC CONCRETE AND REINFORCED CONCRETE CONSTRUCTIONS

Valentin Efimovich Andreev, ulitsa Artema 84, kv. 78; Vyacheslav Ivanovich Pankovsky, ulitsa Cheljuskintsev 151, kv. 60; Yakov Davidovich Zengin, ulitsa Universitetskaya 93, kv. 28; and Taras Fedorovich Golub, ulitsa Universitetskaya 18, kv. 19, all of Donetsk, U.S.S.R.; and Alexei Nikolaevich Buryabash, deceased, late of Donetsk, U.S.S.R.; by Nelya Vasilievna Buryabash, adminstratrix, ulitsa Kirova 151v, kv. 2, Donetsk, U.S.S.R.

Filed July 8, 1970, Ser. No. 53,140
Int. Cl. E04b *1/16;* **E04g** *11/22*
U.S. Cl. 264—32 **1 Claim**



The erection of monolithic concrete and reinforced concrete construction in which the casing rests on the side surfaces of the erected part of the construction due to friction forces and simultaneously a pitch vertical displacement of the casing is effected in the course of concreting, with support members being disposed one above the other in at least two stories and interconnected by hoists, and the support members being equipped with

shields made extensible in the horizontal direction to hold the casing on the side surfaces of the erected part of the construction.

3,778,492

FABRICATION OF THREE-DIMENSIONAL REINFORCED FOAM INSULATION BLOCKS

Carl Robert Lemons, Westminster, Calif., assignor to McDonnell Douglas Corporation

Filed Apr. 3, 1972, Ser. No. 240,524
Int. Cl. B29d *27/04*
U.S. Cl. 264—45 **4 Claims**

A method of making three-dimensional reinforced foam insulation blocks wherein an X, Y, Z grid is made of the reinforcement fibers through which the insulative foam expands in the fabrication process. The placement of Z fibers through the multiple layers of the X–Y grid fibers utilizes a tube array for guidance. Frames for the X–Y fibers form a disposable mold to contain the foam while it expands and cures.

3,778,493

COMPACTING REFRACTORY PARTICLES HAVING A SURFACE COATING OF GELLED SILICA SOL

Richard Dudley Shaw, Dunedin, High Elms Road, Downe, Kent, England

No Drawing. Continuation-in-part of abandoned application Ser. No. 87,348, Nov. 3, 1969. This application Nov. 4, 1971, Ser. No. 195,851
Int. Cl. C04b *33/12, 33/20, 35/14*
U.S. Cl. 264—63 **8 Claims**

Refractory particles are coated with a silica sol derived by hydrolysis of an alkyl silicate and the silica sol is caused to set or gel. The coated particles are dried to a powder, the dry powder is compacted to a desired shape and sintered. Up to 3 percent of alcohol can optionally be added to the dry powder prior to compaction.

3,778,494

SLAKING QUICKLIME IN AQUEOUS SODIUM/POTASSIUM SILICATE SOLUTION IN MANUFACTURE OF HYDROUS CALCIUM SILICATE PRODUCTS

Jerry L. Helser, Hebron, Ohio, assignor to Owens-Corning Fiberglas Corporation

Continuation of abandoned application Ser. No. 819,593, Apr. 28, 1969. This application Aug. 18, 1971, Ser. No. 172,882
Int. Cl. C04b *1/06, 15/12, 31/08*
U.S. Cl. 264—82 **4 Claims**

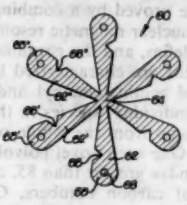
In the manufacture of hydrous calcium silicate thermal insulation products containing fiber reinforcement "voids" and "fold planes" in the final product are a frequent problem. These problems are abated by slaking the quicklime in water containing dissolved sodium or potassium silicate in prescribed amounts. The dissolved silicate forms a coating on the particles of calcium hydroxide that acts as a barrier and retards further and continued hydration. Later the other conventional ingredients are added, the resultant slurry is poured into molds of desired shape, the filled molds are heated with steam to preharden the slurry and finally the filled molds are autoclaved to harden and dry the molded products.

3,778,495

CONTINUOUS PROCESS OF MANUFACTURING POLYMERIC COMPOSITION WRITING POINTS AND DEVICES

Donald D. Woolley, Alhambra, Calif., assignor to The Gillette Company, Santa Monica, Calif.

Continuation-in-part of application Ser. No. 53,571, July 9, 1970. This application Jan. 24, 1972, Ser. No. 220,209
Int. Cl. B28h *21/54*; B29f *3/00*
U.S. Cl. 264—177 F **12 Claims**



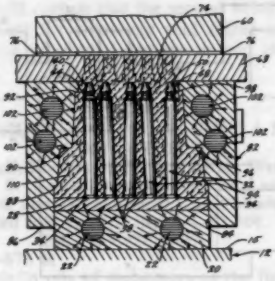
Relates to a method of manufacturing homogeneous, unitary writing elements in a continuous manner whereby the structural and physical properties of a synthetic thermoplastic polymer (or co-polymer) can be utilized at best advantage. The methods herein disclosed are particularly directed to the production of writing elements having a gross cross-sectional area not appreciably greater than 32,000 square mils, such elements having a plurality of minute ink-conveying channels distributed within a circumaxial area not appreciably exceeding one-fourth of the gross cross-sectional area of the element, the aggregate cross-sectional area of the channels being less than about 4% of the gross area of the element. The method utilizes and discloses steps and conditions of extruding and melt-drawing a polymer and then reforming the internal portions of the extruded body by a compressive drawing operation, under stated conditions, to obtain channels of desired size. As a further step the extruded article may be stabilized and relieved of internal stresses by annealing.

3,778,496

METHOD OF EMBEDDING THIN WALL TUBULAR MATERIAL IN PLASTIC UNDER HIGH PRESSURE CONDITIONS

Floyd R. Ladd, West Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed Apr. 5, 1971, Ser. No. 131,022
Int. Cl. B29d *3/00*
U.S. Cl. 264—162 **4 Claims**



A method and means of embedding thin wall tubular material in plastic under high pressure conditions is disclosed herein. The means of this invention comprises a

first plate means with a plurality of spaced apart studs extending upwardly therefrom which are adapted to support tubular members thereon in a substantially vertically disposed position. A casting means is positioned above the first plate means and has a cavity formed therein which is adapted to receive casting material therein and which is adapted to receive the tubular members therein when the casting means is moved downwardly with respect to the first plate means. The casting means has a plurality of guide openings formed therein at the upper end of the cavity which are adapted to receive the tapered upper ends of the tubular members to properly position the same when the casting means is moved to its lower position. Heating elements are also provided to heat the casting material to cause the same to harden at the proper time. The method of embedding the tubular members in the casting material is disclosed with the method causing the tubular members to be properly positioned in a parallel, spaced apart manner so that the finished product can be used as a fluid manifold in an injection machine.

3,778,497
PLUTONIUM RECOVERY FROM ORGANIC MATERIALS

Ronald L. Deaton, Germantown, and Gary L. Silver, Centerville, Ohio, assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed July 28, 1972, Ser. No. 276,210
Int. Cl. C01f *13/00*
U.S. Cl. 423—2 **5 Claims**

The invention comprises a method for removing plutonium or the like from organic material wherein the organic material is leached with a solution containing a strong reducing agent such as titanium (III) (Ti^{+3}), chromium (II) (Cr^{+2}), vanadium (II) (V^{+2}) ions, or ferrous ethylenediaminetetraacetate (EDTA), the leaching yielding a plutonium containing solution which is further processed to recover plutonium. The leach solution may also contain citrate or tartrate ion.

3,778,498
PROCESS FOR RECOVERING URANIUM

Masayuki Yano, Iwao Yamamoto, and Nobuo Yasuhira, Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

No Drawing. Filed Dec. 29, 1970, Ser. No. 102,536
Claims priority, application Japan, Dec. 29, 1969, 45/818; Mar. 12, 1970, 45/21,037; Aug. 31, 1970, 45/76,551
Int. Cl. C01g *56/00*
U.S. Cl. 423—7 **13 Claims**

A process for recovering uranium from a uranium-bearing aqueous solution which comprises contacting a titanated polyvinyl alcohol in the form of particles, flakes, films, filaments, fibers, battings or fabrics with a uranium-bearing aqueous solution to absorb the uranium on the titanated polyvinyl alcohol, and thereafter desorbing the uranium with an aqueous solution of sodium carbonate or ammonium carbonate.

3,778,499
ATMOSPHERE PURIFICATION OF RADON AND RADON DAUGHTER ELEMENTS

Lawrence Stein, Downers Grove, Ill., assignor to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Apr. 13, 1971, Ser. No. 133,704
The portion of the term of the patent subsequent to May 2, 1989, has been disclaimed
Int. Cl. B01d *53/34*
U.S. Cl. 423—210 **8 Claims**

A method for purifying an atmosphere of radon and radon daughter elements which may be contained therein by contacting the atmosphere with a fluorinating solution, whereby the radon and radon daughters are oxidized to their respective fluorides. The fluorides dissolve in the fluorinating solution and are removed from the atmosphere, which may then be recirculated.

3,778,500
METHOD OF PRODUCING $NaF \cdot 2UF_4$

Gifford G. Briggs, Cincinnati, Ohio, assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed May 23, 1972, Ser. No. 256,065
Int. Cl. C01g *43/00*
U.S. Cl. 423—253 **6 Claims**

A method is described for the production of uranium metal from uranyl nitrate or uranyl chloride with an intermediate product of $NaF \cdot 2UF_4$.

3,778,501
REGENERATION OF FLUE GAS DESULFURIZATION SORBENTS

Robert J. Lang, Watchung, N.J., Eugene L. Holt, Elmhurst, N.Y., and David N. Stoneback, Westfield, N.J., assignors to Esso Research and Engineering Company

No Drawing. Continuation-in-part of abandoned application Ser. No. 790,844, Jan. 13, 1969. This application June 4, 1971, Ser. No. 150,173
Int. Cl. B01d *53/34*
U.S. Cl. 423—244 **5 Claims**

Solid sorbents for the removal of sulfur dioxide from gases, such as copper oxide on a suitable carrier material such as alumina, are regenerated with a regeneration gas comprising hydrogen and about 50 to 95% by volume of steam. The presence of steam in the amounts indicated reduces the amount of sulfide formation and thereby increases the capacity of the sorbent and improves the utilization of reducing gas.

3,778,502
METHOD FOR COMBATTING SCALING OF THE SCALP

Guy Aubin, Gentilly, and Georges Manoussos, Paris, France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

No Drawing. Continuation-in-part of abandoned application Ser. No. 748,185, July 29, 1968. This application Feb. 2, 1971, Ser. No. 112,092
Claims priority, application Luxembourg, Aug. 1, 1967, 54,253
Int. Cl. A61k *27/00, 15/12*
U.S. Cl. 424—266 **14 Claims**

A method for combatting scaling of the scalp which comprises applying to the hair and scalp a composition comprising a solution of, as an active ingredient, arginine, histidine and lysine as well as the citric, nicotinic and malic acid salts thereof, including mixtures thereof in a solvent such as water, a lower alkanol and an aqueous solution of a lower alkanol. The active ingredient is present in amounts ranging from 0.2–5 weight percent of the composition which has a pH ranging from about 7.0 to about 11.

3,778,503
SODIUM TETRACYCLINE-METHYLENE-SULFA-METHOXYPYRIDAZINE - PROPANE - SULFONATE AS AN ANTIBACTERIAL AGENT

Maurice Georges Rouchy, Usine de la Claire, Bosseval par Donchery, France

No Drawing. Filed June 30, 1970, Ser. No. 51,388
Claims priority, application France, July 1, 1969, 6922133
Int. Cl. A61k *27/00, 21/00*
U.S. Cl. 424—227 **1 Claim**

The invention relates to new chemical compounds which are useful as drugs and a method of preparing said

compounds. The new compounds are antibiotics of the tetracycline group combined with sulfonamides having free amino or free alkylamino function, the connection between the two types of base molecules being effected by means of an aldehyde bridge. The drugs have properties which are derived directly from those of the base molecules. The drugs are antibiotic, antibacterial and antiparasitic agents.

3,778,504

CERTAIN BENZIMIDAZOLES USED AS ANTI-INFLAMMATORY AGENTS

Francois Clemence, Rosny-sous-Bois, and Odile Le Martret, Paris, France, assignors to Roussel-UCLAF, Paris, France

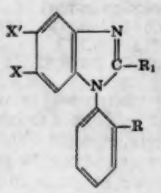
No Drawing. Original application Mar. 18, 1969, Ser. No. 808,298, now Patent No. 3,644,382. Divided and this application Oct. 8, 1971, Ser. No. 187,915

Claims priority, application France, Mar. 20, 1968, 144,581; June 20, 1968, 155,808, 155,810

Int. Cl. A61k *27/00*

U.S. Cl. 424—263 **21 Claims**

Benzimidazoles of the formula



(I)

wherein X and X′ may be different and are selected from the group consisting of hydrogen, halogen, alkyl, alkoxy, trihalomethyl and nitro, R is selected from the group consisting of —COOH—, —COOR′, and

R′ is selected from the group consisting of aliphatic and hydroxylated residue of a glycol, A and B are selected from the group consisting of hydrogen and optionally substituted aliphatic and R_1 is selected from the group consisting of hydrogen, lower aliphatic hydrocarbon, unsubstituted and polysubstituted aryl, arylaliphatic, a thienyl, a β-pyridyl and a furyl with the proviso that when R_1 is phenyl, X′ and X are other than halogen, alkoxy and trifluoromethyl which compounds possess anti-inflammatory and antiviral activity and a novel process for their preparation.

3,778,505

LITHIUM SALT BASED PHARMACEUTICAL COMPOSITION AND METHODS OF USE

Liliane Saint-Martin, Bourg-la-Reine, France, assignor to Societe Civile de Recherches et d'Etudes Therapeutiques, Anthony, France

No Drawing. Filed Nov. 29, 1971, Ser. No. 203,040

Claims priority, application France, Dec. 1, 1970, 7043183; June 17, 1971, 7122039

Int. Cl. A61k *27/00*

U.S. Cl. 424—317 **11 Claims**

A pharmaceutical composition for the treatment of mental affections contains, in dosage form, between about 0.25 and 2.5 g. per administrable dose of a lithium salt of an acid selected from the group consisting of gluconic acid and its isomers, glucoheptonic acid and its isomers, the phosphates of the compounds and mixtures thereof.

3,778,506

USE OF PROSTAGLANDINS TO INDUCE MEDICAL ABORTION

Kenneth T. Kirton, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed June 1, 1971, Ser. No. 148,896

Int. Cl. A61k *27/00*

U.S. Cl. 424—318 **18 Claims**

Prostaglandins are administered in sterile pharmaceutical dosage forms into the fluid of the amnion of a gestating mammal to induce a medical abortion during the second trimester of the gestation period.

3,778,507

DERIVATIVES OF PHOLOROGLUCINOL FOR CAUSING AN ANTISPASMODIC EFFECT

Madeleine Vaille, born Penciolelli, Brunoy, France, assignor to Societe Anonyme dite: ORSYMONDE, Paris, France

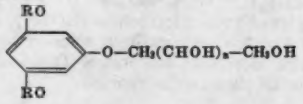
No Drawing. Original application Aug. 29, 1969, Ser. No. 854,264, now Patent No. 3,657,359, dated Apr. 18, 1972. Divided and this application Sept. 16, 1971, Ser. No. 181,190

Claims priority, application France, Sept. 4, 1968, 42,137

Int. Cl. A61k *27/00*

U.S. Cl. 424—340 **9 Claims**

This invention is concerned with the use as antispasmolytic agents of phloroglucinol derivatives which are represented by the formula:



wherein R is a lower alkyl group and *n* is 0 or 1. These compounds having interesting pharmacological properties are obtained by reacting 3,5-dialkoxy-phenol with either glycol chlorhydrin or glycerol chlorhydrin.

3,778,508

FEED COMPOSITIONS AND METHODS

Gino J. Marco, Webster Groves, Mo., and Robert B. Grainger, Palm Desert, Calif., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Nov. 7, 1969, Ser. No. 874,956

Int. Cl. A61k *27/00*

U.S. Cl. 424—300 **15 Claims**

Compositions containing at least one compound of the class of dithiocarbamates are useful for improving the growth response in animals.

3,778,509

CONTROL OF FUNGI ON COTTON PLANTS

Harold Loyd Lewis, Raleigh, N.C., assignor to Cotton, Incorporated, New York, N.Y.

No Drawing. Filed May 28, 1971, Ser. No. 148,178

Int. Cl. A01n *9/24*

U.S. Cl. 424—343 **11 Claims**

Monohydric aliphatic alcohols containing from 4 to 12 carbon atoms are effective in the control of microorganisms which cause diseases of plants such as cotton or which produce toxins that impair the usefulness of products of plants intended for human or animal consumption such as cottonseed oil or meal.

3,778,510

PROCESS FOR THE PRODUCTION OF LYOPHILIZED LIVER EXTRACT

Pierre Blonde, Avenue Noel, 19 bis, Saint-Maur-des-Fosses, France

No Drawing. Continuation of abandoned application Ser. No. 28,550, Apr. 14, 1970. This application Aug. 22, 1972, Ser. No. 282,832

Claims priority, application France, Apr. 15, 1969, 6911589; Mar. 24, 1970, 7010548

Int. Cl. A61k *17/00*

U.S. Cl. 424—106 2 Claims

Lyophilized pharmaceutical compositions which dissolve rapidly in water while having improved mechanical strength and resistance to atmospheric moisture are made by lyophilizing medicaments in aqueous admixture with a crystallizable extender and a water soluble colloid.

3,778,511

α-(1,2,3,4 - TETRAHYDRO-6-QUINOYL)-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF FOR TREATING INFLAMMATION

Raymond Bernasconi, Oberwil, Basel-Land, Switzerland, assignor to Ciba-Geigy Corporation

No Drawing. Original application Apr. 14, 1970, Ser. No. 28,532, now abandoned. Divided and this application Aug. 23, 1972, Ser. No. 283,009

Claims priority, application Switzerland, Apr. 21, 1969, 5,972/69; Mar. 4, 1970, 3,132/70

Int. Cl. A61k *21/00*

U.S. Cl. 424—258 4 Claims

(1,2,3,4-tetrahydro-6-quinolyl)-acetic acids substituted in at least one of the positions 1–5, 7, 8 and α, in which substituents optionally present in the α-position and/or 1-position are lower aliphatic or cycloaliphatic hydrocarbon residues, their esters and derivatives, in which two hetero-atoms, of which at least one is a nitrogen atom, are bonded to the C-atom of the modified carboxyl group, and their salts are useful as antiphlogistic agents.

3,778,512

FUNGICIDAL METHOD UTILIZING FURANCARBOXAMIDES

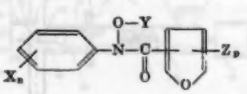
John Krenzer, Oak Park, and Sidney B. Richter, Chicago, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

No Drawing. Original application Dec. 28, 1967, Ser. No. 694,075, now abandoned. Divided and this application June 23, 1970, Ser. No. 59,771

Int. Cl. A01n *9/28*

U.S. Cl. 424—285 6 Claims

A compound of the formula:



wherein *n* is an integer of from 1 to 3; X is selected from the group consisting of halogen, an aliphatic radical, nitro, hydroxy, alkoxy, acyl, acyloxy and cyano; Y is selected from the group consisting of hydrogen, alkyl, acyl, alkoxycarbonyl, alkylthiocarbonyl, alkoxycarbonylalkylene, and a carbamoyl radical; Z is selected from the group consisting of halogen, alkyl, alkoxy and nitro; and *p* is an integer of from 0 to 3 having utility in the control of fungi.

3,778,513

PROCESS FOR PREPARING MEAT EXTRACT-LIKE SEASONING

Akio Shiga and Kengo Ishida, Machida, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

No Drawing. Continuation-in-part of abandoned application Ser. No. 754,964, Aug. 23, 1968. This application Dec. 20, 1971, Ser. No. 210,101

Claims priority, application Japan, Aug. 25, 1967, 42/54,204

Int. Cl. A23l *1/26*

U.S. Cl. 426—7 14 Claims

A process for preparing a meat extract-like seasoning by subjecting the cells of a yeast, bacterium, mold or ray fungus to enzyme or acid decomposition to form an amino acid-peptide mixture having an average peptide length of about 4 to 5 units, adding to the mixture saccharides, organic acids, and/or salts of these acids, 5'-nucleotide and nucleosides, and gelatin and/or sodium alginate, and reacting the resultant mixture at an elevated temperature.

3,778,514

NUTRITIONAL PRODUCT OF WHEY PROTEIN AND COLLAGEN HYDROLYSATE

Floyd C. Olson, Madison, Wis., assignor to Oscar Mayer & Co. Inc., Madison, Wis.

No Drawing. Filed Oct. 9, 1970, Ser. No. 79,674

Int. Cl. A23k *1/00, 1/08*

U.S. Cl. 426—61 6 Claims

Food product comprising whey protein and protein hydrolysate from steam rendering of fats has attractive amno acid profile. Other proteins can be added to further improve the amino acid profile to round out nutritional value; fats or oil can be added to provide a milk-substitute calf food.

3,778,515

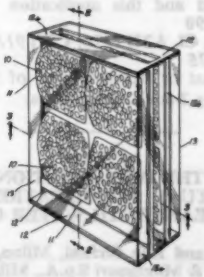
LOW POLLUTION FOOD UNIT

James D. Ashley, 939 Darlington Lane, Crystal Lake, Ill. 60014

Filed Dec. 17, 1970, Ser. No. 99,210

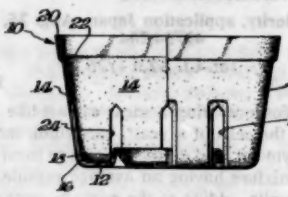
Int. Cl. B65b *25/00*

U.S. Cl. 426—108 2 Claims



A low pollution food unit is described comprising a ready-to-eat breakfast cereal completely enclosed in an edible milk soluble pouch. This package in in turn completely enclosed in a moisture-proof container.

3,778,516
FRUIT CONTAINER
William J. Cornelius, Hendersonville, N.C., assignor to Keyes Fibre Company, Waterville, Maine
Filed Apr. 21, 1972, Ser. No. 246,386
Int. Cl. B65d *1/00, 85/34*
U.S. Cl. 426—119 **3 Claims**



Fruit container comprises bottom wall with upwardly and outwardly flaring side wall connected around periphery of bottom wall. Locating structure in center region of bottom wall extends upwardly therefrom and is arranged to support and locate single fruit layer in container at center of bottom wall. Locating structure is sufficiently spaced from periphery of bottom wall so that second layer of four fruit may be positioned in container above single fruit layer with each fruit of second layer supported by lower single fruit and side wall of container.

3,778,517
COMPOSITIONS OF MATTER CONTAINING HELIOTROPYL NITRILE AS A FLAVORING AGENT AND SWEETENER
James S. Neely, Liberty Township, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed Jan. 20, 1971, Ser. No. 106,936
Int. Cl. A23l *1/26*
U.S. Cl. 426—175 **40 Claims**

Compositions which contain as a flavoring agent and sweetener from about .0001% to about 20.0% of heliotropyl nitrile, i.e. piperonyl nitrile.

3,778,518
FLAVORING WITH CERTAIN 2-ACYL-2-THIAZOLINES
Harald Copier, Velp, and Christiaan Herman Theodoor Tonsbeek, Zevenaar, Netherlands, assignors to Lever Brothers Company, New York, N.Y.
No Drawing. Original application Jan. 7, 1970, Ser. No. 1,284. Divided and this application May 23, 1972, Ser. No. 256,190
Int. Cl. A23l *1/26;* **C07j** *91/24*
U.S. Cl. 426—175 **5 Claims**

The fried, roast or baked flavour of foodstuffs is improved by adding 2-acyl-2-thiazolines.

3,778,519
PROCESS FOR THE IMPREGNATION TREATMENT AND EVENTUAL STERILIZATION OF COCOA SEEDS OR BEANS WITH WATER OR ALKALINE SOLUTIONS
Claudio Taralli and Elio Stefani, Milan, Italy, assignors to Carle & Montanari S.p.A., Milan, Italy
Filed Dec. 2, 1969, Ser. No. 881,414
Claims priority, application Italy, Jan. 8, 1969, 848,426/69
Int. Cl. A23g *1/02*
U.S. Cl. 426—352 **5 Claims**

A process for impregnating a solid vegetable substance, such as cocoa seeds or beans, with an aqueous fluid, such as water or an alkaline solution wherein the vegetable substance is subjected to vacuum action in a suitable environment for a selected period of time, and is then mixed with the impregnating fluid in an environment maintained at a pressure of at least one atmosphere and a temperature of 120° C. or more (sterilization temperature). The impregnated substance is then rapidly dried in an environment at a pressure which is less than one atmosphere.

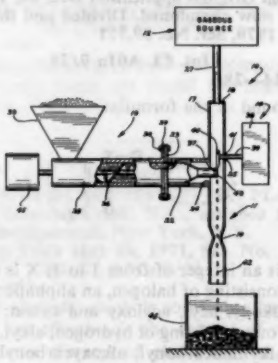
3,778,520
PROCESS FOR EXTRUDING TUBULAR, CORRUGATED PRODUCTS
Richard D. Reinhart and Robert O. Straughn, Minneapolis, Minn., assignors to General Mills, Inc.
Original application Feb. 1, 1967, Ser. No. 613,254, now Patent No. 3,577,435. Divided and this application Dec. 21, 1970, Ser. No. 100,375
Int. Cl. A23l *1/18*
U.S. Cl. 426—446 **2 Claims**

A method for extruding an elongated, tubular, corrugated product having a plurality of longitudinally extending indentations or depressions on its surface. Extrudable material is forced through an annular extrusion orifice formed by a die opening in an extrusion apparatus, and a mandrel positioned in the opening. Either the opening or the mandrel is formed in such a manner that the thickness of the space surrounding the mandrel varies at a number of different points.

3,778,521
PROCESS FOR THE CONTINUOUS PRODUCTION OF BULGUR
Glen W. Fisher, Bellevue, and Dewey H. Robbins, Victor J. Evans, and Gene E. Davidson, Seattle, Wash., assignors to Fisher Flouring Mills Co., Seattle, Wash.
Continuation-in-part of abandoned application Ser. No. 806,890, Mar. 13, 1969. This application May 14, 1970, Ser. No. 37,097
Int. Cl. A23l *1/10*
U.S. Cl. 99—80 PS **21 Claims**

A wheat gelatinization system is provided to produce bulgur on a continuous basis without grain steeping in a relatively short period of time and without employment of a separate cooking stage.

3,778,522
METHOD OF TEXTURIZING PROTEIN
Palmer K. Strommer, Osseo, Minn., assignor to General Mills, Inc.
Filed July 23, 1971, Ser. No. 165,564
Int. Cl. A23j *3/00*
U.S. Cl. 426—511 **10 Claims**



A method for producing a bland textured protein product. The method includes the steps of mixing untex-

tured protein material and water to form an untextured protein dough which is then extruded through a screw extruder into a flowing stream of hot, pressurized vapor such as steam or air.

3,778,523

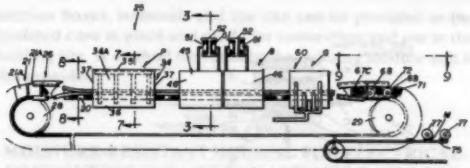
METHOD FOR COOKING STRIPS OF MEAT

Wayne P. Le Van, 310 E. 44th St., New York, N.Y. 10017

Original application July 24, 1970, Ser. No. 57,904, now Patent No. 3,677,171. Divided and this application Feb. 10, 1972, Ser. No. 225,309

Int. Cl. A22c *18/00*

U.S. Cl. 426—510 2 Claims



This disclosure is directed to a method for cooking or broiling strips of meat comestibles, e.g. bacon by conveying a plurality of strips of bacon between a pair of complementary heat pervious belts arranged to travel in unison so that the relative linear speed therebetween is maintained substantially zero. The strips so conveyed are first advanced through a steam oven or bath wherein the strips are preheated to a predetermined temperature. The preheated strips are then conveyed through a broiling oven. Subsequent to the broiling operation the cooked strips are passed through a vacuum chamber in which the liquified fat or grease is removed by evacuation. The bacon strips are then subsequently blotted on each side to further remove the grease or fat adhering thereto prior to the packaging operation.

3,778,524

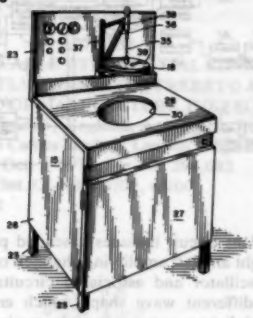
METHOD FOR CLOSING THE OPENING OF A FOOD COOKING RECEPTACLE

Charles Jere Albright, 83 E. Elm St., Chicago, Ill. 60611; and Clifford E. Fitch, Sr., 279 Homewood Court; and Clifford E. Fitch, Jr., 38 W. 23rd St., both of Chicago Heights, Ill. 60411

Continuation-in-part of application Ser. No. 793,392, Jan. 23, 1969. This application Sept. 29, 1971, Ser. No. 184,892

Int. Cl. A22c *18/00*; A23l *1/00*

U.S. Cl. 426—230 4 Claims



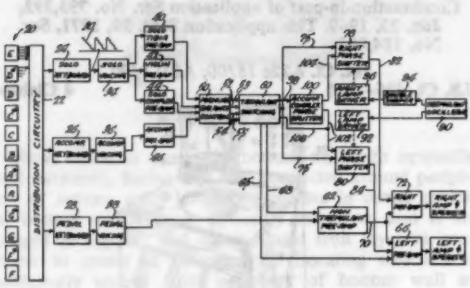
A closure lid and method for effecting an air-tight seal of the opening in a receptacle for the pressurized cooking of food in high temperature, non-aqueous liquids, wherein the closure lid is manually positioned through said opening into the receptacle and is held upwardly into sealing engagement with the rim of said opening by the pressure in said receptacle, said closure lid being manually removable from said opening when the pressure in said receptacle is released.

ELECTRICAL

3,778,525
ELECTRONIC MUSICAL INSTRUMENT WITH PHASE SHIFT TREMULANT SYSTEM

Willis E. Chase, Sierra Madre, and Bradley J. Plunkett, Van Nuys, both of Calif., assignors to Warwick Electronics Inc., Chicago, Ill.

Filed Apr. 17, 1972, Ser. No. 244,573
Int. Cl. G10h *1/04*
U.S. Cl. 84—1.25 **16 Claims**

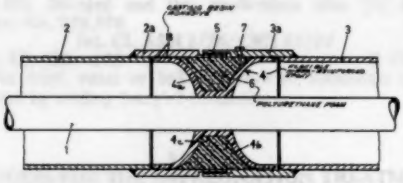


A tremulant circuit includes cascaded phase shifting networks in right and left amplifying channels of an electronic organ. An oscillator and associated circuitry produce offset signals of different wave shape which energize lamps associated with light responsive impedances in the phase shifting networks in the right and left channels. A switching circuit interconnects the phase shifting networks in different configurations to adapt the tremulant effect to a selected organ voice in order to produce the most pleasing and realistic acoustical output.

3,778,526
INSULATION GAS-FILLED TUBULAR CASING STRUCTURE FOR HIGH-VOLTAGE CONDUCTOR

Dieter Floessel, Fislisbach, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed June 12, 1972, Ser. No. 261,933
Claims priority, application Switzerland, Aug. 4, 1971, 11449/71
Int. Cl. H02g *15/24;* **H01b** *9/06*
U.S. Cl. 174—13 **5 Claims**

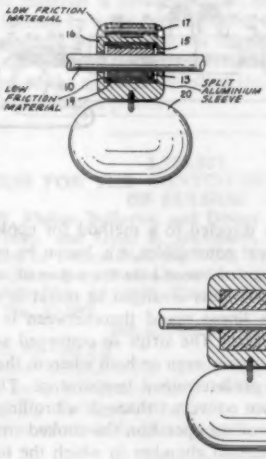


A high-voltage electrical conductor is encapsulated within a rectilinear tubular casing comprising a plurality of tubular sections connected together in essentially end-to-end relation by means of a coupling structure that includes telescoped coupling sleeves secured respectively to the end portions of the casing sections and an elastic support insulator through which the conductor passes and is supported centrally within the casing. The support insulator also includes two oppositely directed cup portions the side walls of which adjoin and are secured to the inner surfaces of the coupling sleeves. Being elastic, the cup portions of the insulator yield elastically in association with a corresponding longitudinal movement of the coupling sleeves to accommodate temperature-induced longitudinal expansions and contractions of the metallic casing sections.

3,778,527
MEANS FOR PREVENTING OR INHIBITING GALLOPING VIBRATIONS IN OVERHEAD TRANSMISSION LINES

Olaf Nigol, 272 Markland Dr., Etobicoke, Ontario, Canada

Filed Mar. 23, 1972, Ser. No. 237,380
Int. Cl. H02g *7/14;* **H01b** *5/08*
U.S. Cl. 174—42 **12 Claims**



In combination with a transmission line conductor suspended from a stationary support structure to which it is connected at a plurality of longitudinally spaced points, the suspended conductor defining a torsionally oscillating system, torsional restraint means connected to or incorporated in the conductor at each span intermediate said spaced points for limiting torsional movements whereby to prevent build up of galloping vibrations.

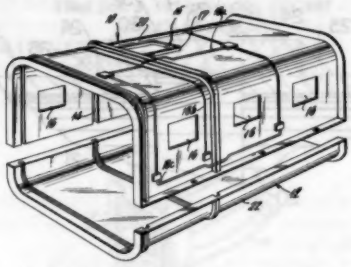
3,778,528
MODULAR BUILDING UNIT AND METHOD FOR MAKING SAME

Saul Heifetz, 3 Ulman Ter.; George Mandelbaum, 3 Windsor Ter., and Irwin Kushner, 1 Ackertown Rd., all of Monsey, N.Y.

Filed Apr. 27, 1972, Ser. No. 247,986
Int. Cl. H02g *3/26*
U.S. Cl. 174—48 **10 Claims**

A prefabricated building module of substantially all plastic construction is provided which can comprise an entire housing unit of one or more rooms thereof. The module is formed in a virtually completed state ready for delivery to a building site for final erection and finishing. The module has walls, floor and ceiling and may include interior partitions to section the unit into a plurality of rooms and to house plumbing, as well as windows, doorways, and doors. The walls, floor and ceiling are formed from inner and outer shells of molded reinforced

plastic material. An insulating core of polyurethane foam material is sandwiched between the shells. All of the electrical, heating, ventilation, air-conditioning and/or gas conduits,



junction boxes, terminals and the like can be provided in the insulated core in place and ready for connection and use at the building site. A method for forming the building module unit is also provided.

3,778,529

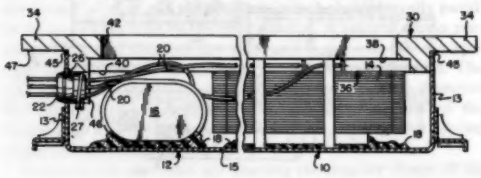
MOISTURE-RESISTANT HOUSING FOR ELECTRICAL COMPONENTS AND METHOD AND APPARATUS FOR MAKING THE SAME

Imrich M. Miller, Paterson, N.J., assignor to Universal Manufacturing Corporation, Paterson, N.J.

Filed May 11, 1972, Ser. No. 252,427

Int. Cl. H05k *5/06*

U.S. Cl. 174—52 PE **14 Claims**



A cover is provided over a housing containing various electrical components which, upon formation with a seam to make the housing substantially waterproof, has a channel portion formed which can flex in response to an outward force generated within the housing. A guide plate having spacers is provided for use during the potting of the electrical components which forms areas within the housing for receiving the channel portion of the cover formed during the seaming of the cover to the housing.

3,778,530

FLATPACK LEAD POSITIONING DEVICE

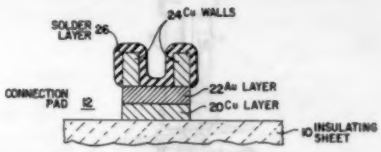
William George Reimann, 8163 Willow Glen Rd., Los Angeles, Calif.

Division of Ser. No. 130,402, April 1, 1971, Pat. No. 3,700,443. This application July 5, 1972, Ser. No. 269,126

Int. Cl. H05k *3/34*

U.S. Cl. 174—68.5 **10 Claims**

A printed circuit board for mounting integrated circuit and resistor network packages commonly referred to as flatpack components and a process for fabricating the circuit board. The printed circuit board has a conductive pattern of electrical connection pads for connecting to electrical leads from flatpack components and electrical conductors for connecting the pads to circuitry external to the board. A channel for receiving and aligning each electrical lead from a flatpack component is formed by printed circuit techniques. The sur-



face layer of each channel is formed of solder which simplifies the process of electrically connecting flatpack leads and reduces errors occuring in the soldering process.

3,778,531

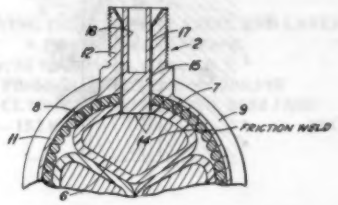
DISTRIBUTION CABLE WITH COAXIAL CONNECTORS PERMANENTLY CONNECTED THERETO AND A METHOD OF MANUFACTURE THEREOF

Peter Higgins, Hounslow, England, assignor to British Insulated Callender's Cables Limited, London, England

Filed Oct. 2, 1972, Ser. No. 294,082

Int. Cl. H01r *3/02, 43/00*

U.S. Cl. 174—72 R **18 Claims**



In an electrical distribution cable comprising a number of insulated electric power conductors and a neutral conductor, the assembly of conductors being enclosed in a protective insulating sheath, a coaxial connector is permanently secured to the cable at each of a plurality of spaced locations along its length before it is installed. The inner conductive element of each connector is electrically connected to one of the power conductors of the cable and the outer conductive element of the connector is electrically connected to the neutral conductor of the cable. Each of the coaxial connectors is at least partially embedded in a protective insulating covering integral with or bonded to the protective sheath of the cable. The neutral conductor may be laid up helically with or parallel to the power conductors or it may be in the form of an outer concentric conductor.

3,778,532

ELECTRICAL CIRCUIT COMPONENT HAVING SOLDER PREFORM CONNECTION MEANS

Denver Braden, San Diego, Calif., assignor to Illinois Tool Works Inc., Chicago, Ill.

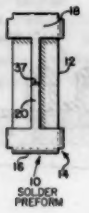
Filed July 3, 1972, Ser. No. 268,357

Int. Cl. H05k *1/18*

U.S. Cl. 174—74 R **6 Claims**

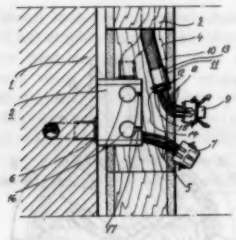
An electrical circuit component including a solder preform which envelops connection terminals on the ends of an electrical circuit body of the element is disclosed. When heat is applied to the solder preform, the solder flows and electrically

connects the component into an electric circuit. The solder preform has two end portions that are joined by a bar of



reduced cross section which melts upon the application of heat. The solder preform also includes laterally extending flaps which embrace the side edges of the circuit element.

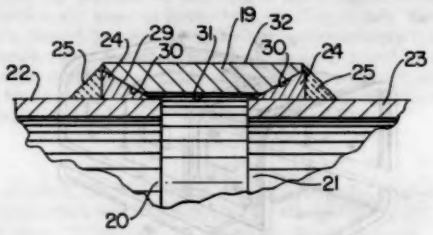
3,778,533
DEVICE FOR JUNCTION BOXES
Kjell Hundal, Trombvagen 8, 17500 Jakobsberg, Sweden
Filed Feb. 14, 1972, Ser. No. 226,044
Int. Cl. H02g *3/18*
U.S. Cl. 174—65 R **1 Claim**



A junction box is made from a resilient plastic material and has in its envelope surface openings which via narrow slots open towards the open end portion of the box. The wires which are to be introduced in the box are preferably provided with connecting means for electrically connecting them with other wires and at least one of said wires is in addition thereto provided with a sleeve having a reduced portion the dimension of which corresponds to that of the openings such that said sleeve may be received therein. By exerting upon the surfaces at each side of said slot opposite directed pressures said sleeve may be secured to the box and the wires sideways introduced in the box.

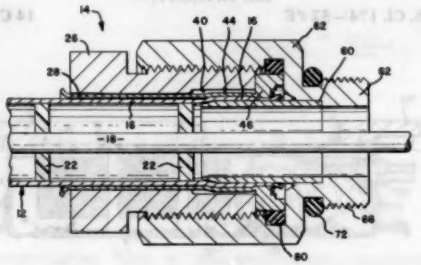
3,778,534
COUPLING CONSTRUCTION AND METHOD AND APPARATUS FOR MAKING THE SAME
William B. Jenkins, Henrico County, Va., assignor to Reynolds Metals Company, Richmond, Va.
Filed Sept. 29, 1971, Ser. No. 184,726
Int. Cl. H02g *15/08*
U.S. Cl. 174—88 C **6 Claims**

A pair of electrically conductive metallic sheath members respectively have ends disposed adjacent and spaced from each other in aligned relation with a metallic coupling sleeve disposed in telescoping relation about the adjacent ends of the sheath members. A pair of annular metallic shims are respectively deformed into substantially sealing engagement with and between a respective sheath member end and the sleeve to substantially close the spacing between the sleeve and the respective sheath ends whereby weld material subsequently utilized for securing the deformed shims respectively to the coupling sleeve and the sheath members at the exterior



thereof does not cause contamination in the interior of the coupling sleeve and sheath members to adversely affect the high voltage conductor passing therethrough.

3,778,535
COAXIAL CONNECTOR
Edgar Wilmot Forney, Jr., Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed May 12, 1972, Ser. No. 252,791
Int. Cl. H02g *15/08*
U.S. Cl. 174—88 C **8 Claims**



A coaxial cable connector featuring inner and outer ferrules between which the outer conductor of a semi-rigid cable is squeezed. The assembly of the connector onto the cable is accomplished with ordinary standard hand wrenches operating on an outer coupling containing the outer ferrule nut threadedly engaging a connector body containing the inner ferrule. The structure of the connector preserves the critical diameters of the coaxial cable thereby reducing or eliminating reflective loss of radio frequency energy.

3,778,536
ELECTRICAL INSULATION
Robert W. Smearing, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Dec. 20, 1971, Ser. No. 210,087
Int. Cl. H01b *7/02;* **B32b** *15/14*
U.S. Cl. 174—121 SR **3 Claims**

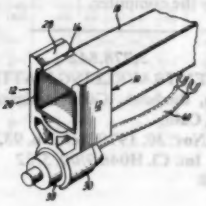
The resin content and electrical insulating capability of porous insulation is enhanced by providing the outer portion of the insulation with cure accelerator for the resin impregnant whereby the outer portion cures more rapidly than the inner portion.

3,778,537

CLIP DEVICE FOR MOUNTING ACCESSORY ON AN ANTENNA BOOM

Richard A. Miller, Burlington, Iowa, assignor to Antennacraft Company, Burlington, Iowa

Filed Jan. 5, 1973, Ser. No. 321,387
Int. Cl. F16b *2/22*
U.S. Cl. 174—138 R 5 Claims



A clip device for mounting accessories on antenna booms comprising a frame of plastic material having a first U-shaped clamp portion, the arms and base of which have interior surfaces that generally conform to three sides of a straight boom of square cross-section. The arms have inwardly projecting retainer flanges, respectively, on the distal ends thereof. The flanges have inner surfaces that generally conform to the fourth side of the aforesaid boom. The flanges have outer cam surfaces that are flat and incline downwardly and inwardly toward the base. The facing surfaces of the arms between the ends are slightly curved outwardly, the arms being resilient. The base is provided with a part-cylindrical depression symmetrically disposed between the ends. The inner surfaces of the clamp portion are symmetrical about and generally parallel to an axis through the central portion. A second clamp portion is disposed beneath the base and is secured thereto by a rigid connection, all these parts being integrally formed. The second clamp portion is part tubular in shape and so disposed that the opening thereof extends oppositely to that of the opening in the first clamp portion. The arms of the second clamp portion are also resilient.

Adapters are provided for altering the interior shape of the clamp portion, one typical adapter having a part-cylindrical curvature on the inner side thereby to adapt the clip device to be fastened to a cylindrical boom. Another typical adapter is primarily square shaped thereby to adapt the clip device for fastening to a boom of square cross section smaller than that to which the first clamp portion may be directly fastened.

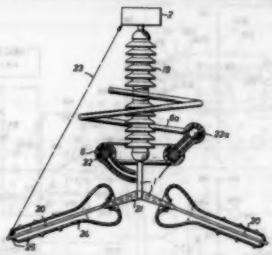
3,778,538

INSULATING ARRANGEMENT FOR INCREASING BREAKING VOLTAGE STABILITY OF HIGH VOLTAGE INSTRUMENTALITIES

Werner Widmann, Stuttgart, 50 Germany, assignor to Transformatoren Union Aktiengesellschaft, Stuttgart-Cannstatt, Germany

Filed Dec. 20, 1971, Ser. No. 210,069
Claims priority, application Germany, Dec. 18, 1970, P 20 62 359.0; May 12, 1971, P 21 23 566.5
Int. Cl. H01b *17/46;* H01t *17/00*
U.S. Cl. 174—140 R 15 Claims

A high voltage instrumentality including electrodes having wide sparking distances and inhomogeneous field lines between them in air. An insulating arrangement provides a guided path for premature discharges in a direction from one of the electrodes to another of the electrodes. The insulating arrangement is substantially closed on all sides defining the guided path which is longer than the path which would be traversed without guidance. The premature discharges which develop whenever ionization field strength is exceeded are conducted within the insulating barrier arrangement.



3,778,539

PLUG HAVING INDEPENDENT AXIAL AND LATERAL COMPRESSION MEANS

John P. Baier, 61 W. Parkway, Greece, N.Y.

Filed Sept. 5, 1972, Ser. No. 286,110
Int. Cl. H01b *17/30;* F16j *15/10;* B65d *53/00*
U.S. Cl. 174—152 R 10 Claims

Plug having independent axial and lateral compression means for plugging holes in a container, a housing and the like is disclosed. The plug complies to irregular surfaces and reacts in three directions utilizing compression and shearing forces to effect a pressure tight seal.

3,778,540

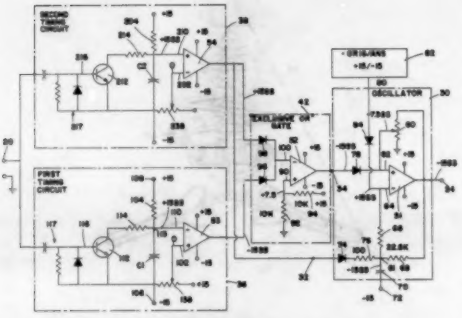
AUTOMATIC ELECTRONIC HERE IS GENERATOR

Richard D. Fretwell, 1891 Willoway Cir. North, Columbus, Ohio

Filed Apr. 20, 1972, Ser. No. 245,792
Int. Cl. H04l *15/34*
U.S. Cl. 178—4.1 B 10 Claims

A "here is" generator, for an automatic answering data terminal, which generates a WRU code and applies it to the ter-

minal's answer-back mechanism. The generator has a square wave oscillator and a pair of timing circuits which initially free



the oscillator for oscillation then clamp it in a mark output and finally clamp it in a steady state space output.

3,778,541

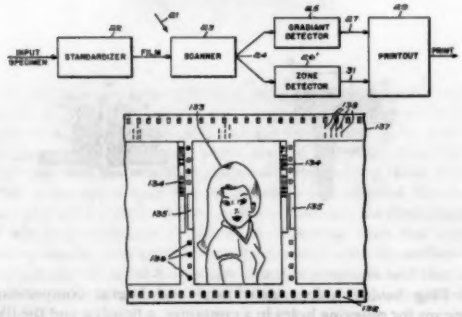
SYSTEM FOR ANALYZING MULTICOLORED SCENES

John Kent Bowker, Marblehead, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Sept. 3, 1971, Ser. No. 181,141

Int. Cl. H04n *1/22*

U.S. Cl. 178—5.2 R **27 Claims**



A given scene such as that retained by a colored photograph is scanned both by a high resolution scanner that detects image density gradients and a color analyzer with lower resolution. Controlled by the gradient detecting scanner is a printer that produces, on an appropriate work surface, a line drawing delineating prominent object boundaries in the image. The color information extracted from discrete areas of the image by the color analyzer is compared by a computer with colors available in a preselected finite set of distinctly colored substances and an appropriate selection is made from the set for each area analyzed. In response to the computer selections, a color indicia printer produces on the work surface a color outline of surface areas geometrically corresponding in position to the discrete areas of the image. The color outline is superimposed on the line drawing but is distinguishable therefrom. Also produced by the color printer within each surface area is indicia representing the particular colored substance selected for application thereto.

In a preferred embodiment, the density gradient and color analyzer scans are made simultaneously in parallel adjacent paths across the image. The line printer responds instantaneously to the output of the high resolution gradient detector. The color analyzer, however, supplies information at intervals along the scan and the color indicia printer prints on each scan line information from the preceding scan line and in a position corresponding to the area from which the information was obtained. The delay in color indicia printout provides time for color evaluation by the computer.

3,778,542

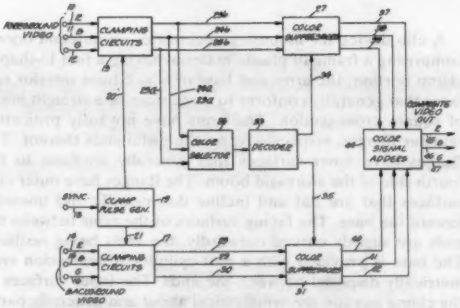
BLUE SCREEN TRAVELLING MATTE SYSTEM

Leo C. Hanseman, Burbank, Calif., assignor to Technicolor Inc., Hollywood, Calif.

Filed Nov. 30, 1970, Ser. No. 93,574

Int. Cl. H04n *9/00, 5/22*

U.S. Cl. 178—5.4 R **21 Claims**



There is disclosed herein apparatus and methods for the creation of special photographic effects, such as blue screen travelling matte effects. A particular selectable saturated color appearing in the simultaneous red, blue and green video output signals of an electronic color camera, for example, is sensed and removed from the video signals by electronic subtraction of the selected color. The output red, blue and green video signals derived from a second electronic color camera are substituted for the removed saturated color. The final composite red, blue and green video output signals therefore contain picture elements from both cameras, combined in a manner such that the specific saturated color from the first camera is completely eliminated and replaced by picture elements derived from the second camera.

3,778,543

PREDICTIVE-RETROSPECTIVE METHOD FOR BANDWIDTH IMPROVEMENT

John D. Lowry, Willowdale, Ontario, Canada, assignor to Elanin Investments Ltd., Ontario, Canada

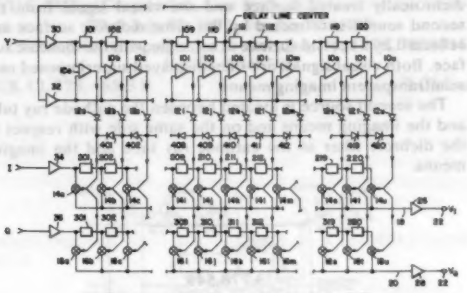
Filed Sept. 5, 1972, Ser. No. 286,456

Int. Cl. H04n *5/14*

U.S. Cl. 178—5.4 R **10 Claims**

The relatively long rise and fall time of narrow-bandwidth television chroma signals is sharply reduced by the use of a processing circuit using the corresponding luminance signal as a control. The processing circuit determines the presence of a transistion in the video signal and, through the use of delay line chains, averages the chroma signals from a plurality of preceding time points up to the center of the transition, and

then switches to average the chroma signal from a plurality of subsequent time points. The thus averaged chroma signals exhibit a very rapid rise time which results in a much sharper color transition in the picture than the unprocessed video signal can produce.

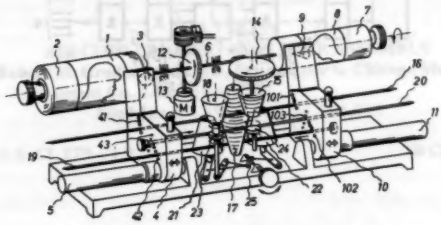


3,778,544

APPARATUS FOR THE ELECTRO-MECHANICAL PRODUCTION OF PRINTING MATRICES ON VARIABLE SCALE OF REPRODUCTION

Friedrich Richter, Preetz/Holst., Germany, assignor to Dr. Ing. Rudolf Hell GmbH, Kiel, Germany

Filed Sept. 28, 1971, Ser. No. 184,500
Claims priority, application Italy, Oct. 2, 1970, 70293 A/70
Int. Cl. H04n *1/22*
U.S. Cl. 178—6.6 B **7 Claims**



In an apparatus for producing printing matrices wherein a scanning means scans a picture or image and an engraving device produces a picture, a reduction gear introduced between the image carrier drive and the feed or displacement of the engraving device, the reduction gear having a translating ratio which is variable so that either a longer or smaller scale reproduction can be produced.

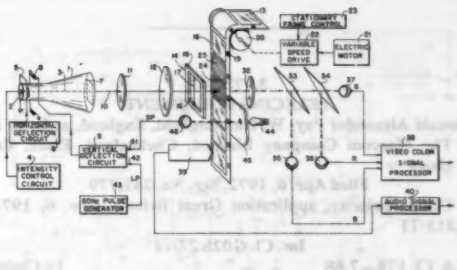
3,778,545

FILM SCANNING FOR TELEVISION REPRODUCTION

Lenard M. Metzger, and David L. Babcock, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 3, 1970, Ser. No. 60,493
Int. Cl. H04n *5/36*
U.S. Cl. 178—7.2 **32 Claims**

A continuously moving or stationary image bearing medium is automatically scanned to produce video signals for television in response to the detected rate of movement of the medium. The image frames of the medium are scanned in a television field scanning raster pattern of spaced lines at the standard horizontal and vertical deflection frequencies. The rate of movement of the medium is detected, and two 180° out of phase, half-frame rate frequency, sawtooth wave form signals are generated therefrom. Periodic portions of one or the other of the two sawtooth wave forms are combined with the standard vertical deflection frequency, sawtooth wave form signal to produce a complex vertical deflection frequency, sawtooth wave form signal that is effective to automatically register the scanning raster pattern on the proper moving image frame. A stationary frame is detected and automatically scanned by the standard vertical deflection, sawtooth wave form signal, and irregularities in the spacing of the frames or the film rate are automatically compensated for.

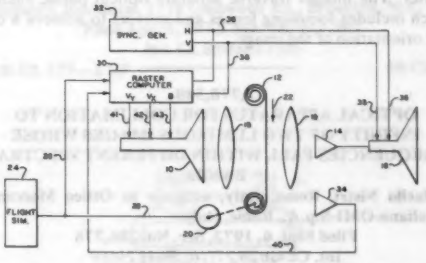


3,778,546

CRT DISPLAY OF A MOTION PICTURE FILM

John R. Trzeciak, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Continuation-in-part of Ser. No. 174,110, Aug. 23, 1971, abandoned. This application Oct. 16, 1972, Ser. No. 297,899
Int. Cl. H04n *3/16*
U.S. Cl. 178—7.2 **7 Claims**



The light spot of a flying spot scanner is directed upon a scanned frame of a motion picture film which is transported at a desired frame rate through the scanning field of the scanner. The light spot is deflected in response to horizontal and vertical deflection voltages provided to the scanner. The horizontal deflection voltage is proportional to the horizontal deflection of the beam of a cathode ray tube whereon a viewing raster is traced. The vertical deflection voltage is provided by a summing amplifier which has one input connected to a signal proportional to the vertical deflection of the beam and the other input connected to the output of an integrator circuit which provides a displacement signal proportional to the integral of the frame rate. In response to the deflection signals, the spot of the scanner traces a scanning raster which is shifted to compensate for the frame rate of a scanned frame. Disposed to receive light emanating from the scanned frame is

a photomultiplier which provides a video signal proportional to the emanating light to the cathode ray tube, thereby displaying the scanned frame thereon. In response to the displacement signal being greater or equal to a signal representative of the scanned frame leaving the scanning field during the vertical retrace of the scanning raster, the integrator circuit is reset to provide a displacement signal representative of the displacement of a succeeding frame in the scanning field.

3,778,547
TELECINE EQUIPMENT

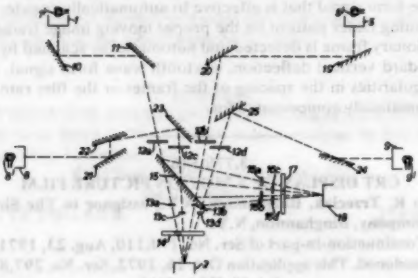
Donald Alexander Pay, W. Hanningfield, England, assignor to The Marconi Company Limited, Chelmsford, Essex, England

Filed Apr. 6, 1972, Ser. No. 241,779

Claims priority, application Great Britain, Apr. 6, 1971, 8,815/71

Int. Cl. G02b 27/14

U.S. Cl. 178—7.88 **16 Claims**



Images from several projectors are selectively directed onto the viewing tube of a telecine equipment via an adjustable shutter, and onto a monitor tube via another adjustable shutter. The images traverse separate optical paths, each of which includes focussing lenses and mirrors to achieve a correct orientation of the image.

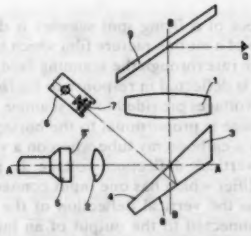
3,778,548
OPTICAL APPARATUS FOR COLLIMATION TO INFINITY OF TWO LUMINOUS IMAGES WHOSE FREQUENCIES FALL WITHIN DIFFERENT SPECTRAL BANDS

Raffaello Nistri, Rome, Italy, assignor to Ottico Meccanica Italiana-OMI-S.p.A., Rome, Italy

Filed Sept. 6, 1972, Ser. No. 286,776

Int. Cl. G02b 27/10; H01j 29/89

U.S. Cl. 178—7.88 **6 Claims**



An optical display apparatus for use in an aircraft includes a cathode ray tube operating with one color display on the screen thereof and another source of visual information operating with another colour. These two information sources are displayed to an observer after collimation to superimpose the information on a distant scene.

The visual signal from the cathode ray tube is reflected by a dichroically treated surface and the visual signal from the second source is refracted by the same dichroic surface and reflected by a second surface at an angle with the dichroic surface. Both visual signals are then displayed superimposed on a semitransparent imaging means.

The second source is located between the cathode ray tube and the imaging means and on the same side with respect to the dichroic filter as the cathode ray tube and the imaging means.

3,778,549
TRANSMISSION ARRANGEMENT

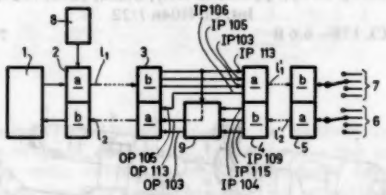
Jurgen Schroder; Gunter Ochel, and Hans-Joachim Von Horsten, all of Bremen, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 8, 1972, Ser. No. 224,565

Claims priority, application Germany, Feb. 13, 1971, P 21 06 835.9

Int. Cl. H04l 15/00

U.S. Cl. 178—68 **7 Claims**



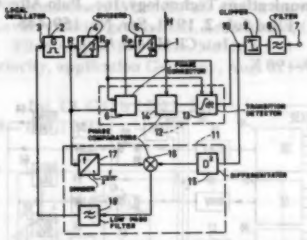
In a transmission system for connecting a computer selectively to various pieces of equipment through a transmission network using modulators-demodulator (modem) transmission, a clock-pulse generator is directly coupled to the transmitter of an internal modem so that the equipment selectively connected to the computer through an external modem and the internal modem is synchronized with the frequency of the clock pulse generator although delayed in phase therewith. The signals received from the equipment selectively connected to the computer by the receiver of the internal modem are alternately stored in two flip-flops of a coupling device under the control of a first two-phase clock signal derived from the signal received in the internal modem. The receiver of the external modem connected to the computer interrogates the storage flip-flops alternately with a second two-phase clock signal derived from the clock pulse generator connected to the external modem. Thus, storage of the received data under the control of the first two-phase clock pulse signal derived from the frequency of the data and subsequent interrogation of the stored information under the control of a second two-phase clock signal derived from the clock pulse generator used to transmit signals to the equipment producing the data signals synchronizes the phase of the received data signals with the phase of the transmitted information.

3,778,550

SYSTEM FOR SYNCHRONIZING CLOCK SIGNALS TO INCOMING DATA

Guy Albert Jules David, Thiais, and Michel Guy Amedee Duquenne, Meudon Bellevue, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 27, 1971, Ser. No. 166,480
Claims priority, application France, July 31, 1970, 7028316
Int. Cl. H04l 7/00
U.S. Cl. 178—69.5 R 7 Claims



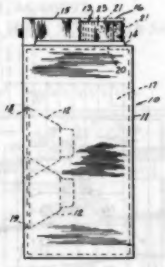
A synchronizing device locally reproducing with very high precision the phase of a clock signal at the rhythm of which data are received, comprising two independent control circuits, one for correcting the frequency of the local oscillator, the other for correcting the phase of the local clock signal; in the phase correcting arrangement a device detecting the transition of the incoming data supplies pulses at the zero passages of the digital integrators, which pulses are filtered in a digital filter which produces phase-correction instructions to a correction device.

3,778,551

AIR COOLED AUDIO AMPLIFIER ASSEMBLY

Robert M. Grodinsky, Skokie, Ill., assignor to Chicago Musical Instrument Co., Lincolnwood, Ill.

Filed Jan. 17, 1969, Ser. No. 791,921
Int. Cl. H04m 1/02
U.S. Cl. 179—1 E 10 Claims



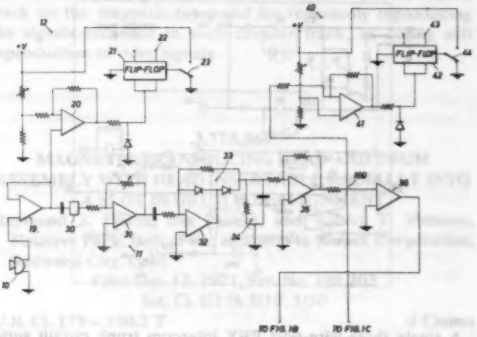
An audio amplifier assembly employs transistors which are subject to substantial heating, and which are mounted on heat sinks situated on the cabinet of the device, there being air passages leading from the speaker cavity within the cabinet directly to such transistors so that the speaker cone serves as a pump for cooling air that passes across such transistors.

3,778,552

PERSONAL SOUND MONITOR

Julius A. Edinborgh, Spring, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sept. 27, 1972, Ser. No. 292,593
Int. Cl. G01h 5/00
U.S. Cl. 179—1 N 10 Claims



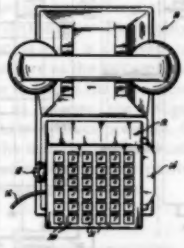
A personal sound monitor wherein the sound is detected by a microphone and converted to a related electrical signal. The level of the signal is used to gate one of the plurality of levels in a scanning digital counter, the levels corresponding to various predetermined sound levels. The scanning counter controls the gating of various frequencies to an accumulating counter so that the total count is proportional to the integrated sound level to which the individual has been exposed.

3,778,553

ATTACHMENT FOR FACILITATING USE OF A PUSH-BUTTON TELEPHONE SET AS A DATA TERMINAL

Michael I. Rackman, 1710 Glenwood Rd., Brooklyn, N.Y.

Filed Apr. 5, 1972, Ser. No. 241,307
Int. Cl. H04m 11/06
U.S. Cl. 179—2 DP 20 Claims



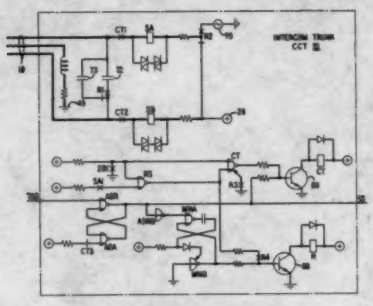
An attachment for a push-button telephone set which fits directly over the ten (or twelve) telephone push-buttons. On top of the attachment there is provided a separate push-button for each letter and digit. Whenever one of the attachment push-buttons is pressed down, two telephone set push-buttons are pressed down in succession so that a two-digit code is transmitted for each letter or digit without requiring the user to operate two telephone set push-buttons in succession to distinguish between letters and digits.

3,778,554

SINGLE THREE-WIRE-PORT PBX INTERCOM TRUNK CIRCUIT ARRANGEMENT

David William Weiner, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 24, 1971, Ser. No. 146,243
Int. Cl. H04q *1/28*
U.S. Cl. 179—18 AD **4 Claims**



A single three-wire-port PBX intercom trunk circuit supplies battery, ringing, and supervision through a switching network from the trunk circuit to a pair of interconnected stations. The intercom trunk circuit and line circuits of the stations are arranged to provide all essential controls for the calling and called stations.

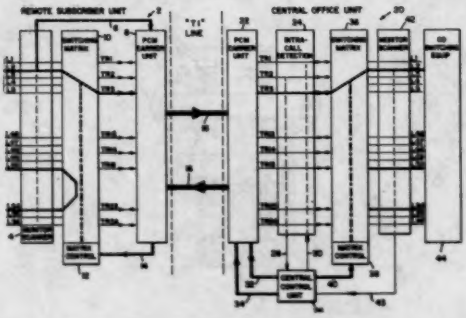
Interconnections from the intercom trunk circuit to the stations are arranged so that talking current conducted to any one station is substantially independent of the loop resistance of any other station to which the one station is connected.

3,778,555

TELEPHONE SUBSCRIBER LINE SYSTEM INTRA CALL APPARATUS AND METHOD

K. Fredrik Nordling, Sonoma, and Samuel T. Huey, Larkspur, both of Calif., assignors to Digitel Telephone Systems, Inc., San Rafael, Calif.

Filed July 19, 1971, Ser. No. 163,669
Int. Cl. H04q *3/60*
U.S. Cl. 179—18 FC **18 Claims**



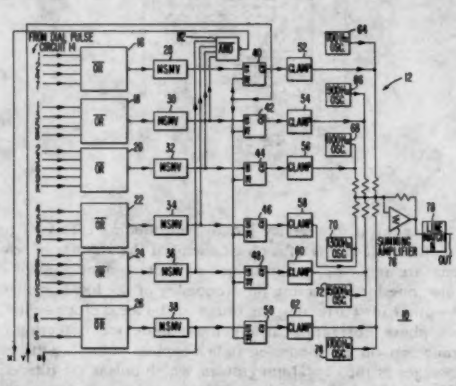
Intra-calling capability is provided at the remote unit of a telephone subscriber line system (SLS). When a subscriber calls another subscriber on the same SLS he initially goes "off-hook," receives one of the carrier trunks, dials, and the switching network at the serving central office in turn applies ringing to the station being called. If this station is served by the same SLS, a transfer of the call will be made to an intra link upon answering of the call by the called subscriber, thus leaving the two trunk carrier channels for use by other subscribers. The lines of the two subscribers on the intra link appear busy at the central office. Should all the intra links be in use, the system still permits two subscribers on the same SLS to continue their use of two trunks. There is no numbering restriction placed on the lines.

3,778,556

TELEPHONE SIGNALING AND TESTING APPARATUS WITH PROVISIONS FOR EITHER PULSE OR MULTIFREQUENCY DIALING

James G. Mees, Saratoga; Andre Lubarsky, Jr., and Goro R. Tahara, both of Sunnyvale, all of Calif., assignors to Telecommunications Technology, Inc., Palo Alto, Calif.

Filed July 2, 1971, Ser. No. 159,446
Int. Cl. H04m *1/30*
U.S. Cl. 179—90 K **17 Claims**



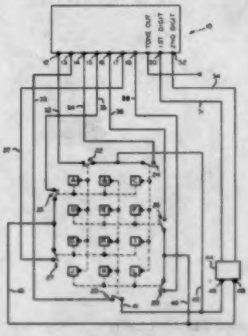
Telephone signaling and testing apparatus is provided to generate either dial pulse coded signals or multiple frequency coded signals for use in signaling or testing along transmission lines.

3,778,557

ENCODER

Jeffrey E. Frederiksen, Milwaukee, Wis., assignor to Post Corporation, Appleton, Wis.

Filed Mar. 22, 1972, Ser. No. 237,156
Int. Cl. H04m *1/26*
U.S. Cl. 179—90 K **32 Claims**



A programmable binary frequency dividing circuit is connected to an oscillator for providing predetermined number of

frequency signals. The first and second plurality of logic gates are each coupled to the frequency divider for receiving preselected ones of the frequency signals and for providing output tones having a frequency dependent upon the relationship of the frequency signals received. Switching means sequentially provide output tones from selected pairs of the logic gates.

3,778,558

METHOD AND ARRANGEMENT FOR SOUND TRACK RECORDING IN WHICH BACKGROUND MUSIC IS DAMPED DURING SPEECH SIGNALS

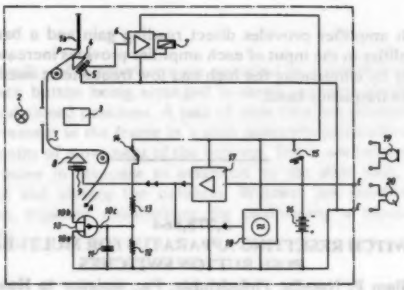
Richard Wick, Munich; Alfred Brath, Unterhaching, and Eduard Wagensonner, Munich, all of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 3, 1971, Ser. No. 168,553

Claims priority, application Germany, Aug. 8, 1970, P 20 39 461.0

Int. Cl. G11b *27/22, 27/30, 5/02*

U.S. Cl. 179—100.2 MD **11 Claims**



Speech and background music to be recorded on a sound track. Speech recorded first. During subsequent recording of background music, the background music is damped over portions of sound track having sound signals.

3,778,559

ROTARY HEAD MAGNETIC RECORDING AND REPRODUCING APPARATUS WITH PLIANT RECORD DISK FOR STILL REPRODUCTION OF VIDEO SIGNALS

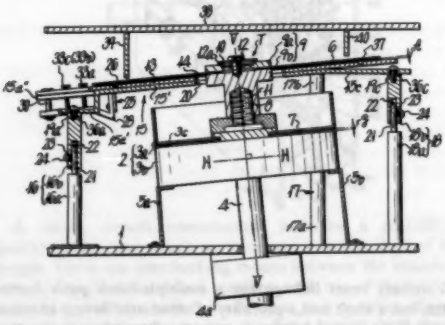
Nobutoshi Kihara, Tokyo, and Yoichi Odagiri, Kanagawa-ken, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 9, 1972, Ser. No. 261,414

Claims priority, application Japan, June 15, 1971, 46/50956; July 8, 1971, 46/60092

Int. Cl. H04n *5/76;* **G11b** *5/00*

U.S. Cl. 179—100.2 T **9 Claims**



An apparatus which magnetically records and/or reproduces signals, particularly video signals, by means of a rotary magnetic head which scans skewed record tracks on a magnetic tape as the latter is advanced, for example, about the periphery of a guide drum, in a path that coincides with at least a portion of the circular path of the rotary head, is further provided with a pliant record disk secured at its center to the drive shaft for the rotary head and having a magnetizable surface that confronts a support plate extending perpendicular to the shaft axis and through which a stationary magnetic head extends for recording, in a circular track on the record disk, the signals reproduced from a skewed record track on the magnetic tape, and for repeatedly reproducing the signals recorded in such circular track, as during still reproduction of video signals.

3,778,560

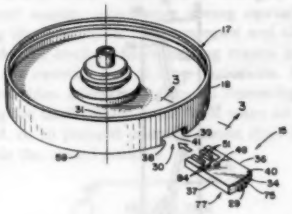
MAGNETIC TRANSDUCING HEAD AND DRUM ASSEMBLY WITH HEAD INSERTABLE RADIALLY INTO A SLOT IN DRUM FOR ALIGNMENT

Raymond J. Precin, Des Plaines, and Robert T. Mattoon, Hanover Park, both of Ill., assignors to Ampex Corporation, Redwood City, Calif.

Filed Oct. 12, 1971, Ser. No. 188,203

Int. Cl. G11b *5/10, 5/50*

U.S. Cl. 179—100.2 T **4 Claims**



A magnetic transducing head is precisely located with respect to a circumferential wall of a rotating drum of a magnetic recording and reproducing apparatus and is located at a predetermined angular position on the drum and in plane perpendicular to the rotational axis of the drum. A radially directed slot is formed in the drum to slideably accept the transducing head which has a pole piece tip preset to project for a predetermined distance from the circumferential wall when a reference surface on the magnetic head is aligned with a reference surface on the drum. Preferably, the reference surface on the transducing head is a curved outer wall having the same radius of curvature as the circumferential wall for alignment with the latter to locate the tip precisely beyond the circumferential wall to engage the magnetic tape with a preferred head-to-tape contact pressure. Other slideably engaged surfaces on the transducing head and the slot align with the head at its predetermined angular position and in the plane perpendicular to the axis of the drum.

3,778,561

ELECTRET MICROPHONE

Cornelis Wilfred Reedyk, Ottawa, Ontario, Canada, assignor to Bell Canada-Northern Electric Research Limited, Ottawa, Ontario, Canada

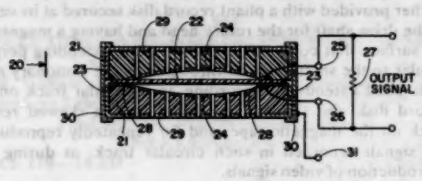
Filed June 21, 1972, Ser. No. 264,889

Int. Cl. H04r *19/00*

U.S. Cl. 179—111 E **4 Claims**

An electroacoustic transducer uses an electret which does

not require metallization of a surface thereof. The electret is sandwiched between a pair of stationary, air-permeable electrodes disposed substantially coplanar and the output of the transducer is obtained from across the pair of electrodes.

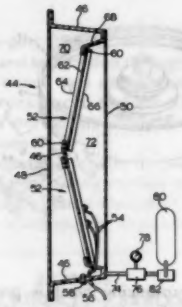


3,778,562

ELECTROSTATIC LOUDSPEAKER HAVING ACOUSTIC WAVEFRONT MODIFYING DEVICE

William Michael D. Wright, Thornhill, Ontario, Canada, assignor to Dayton Wright Associates Limited, Toronto, Ontario, Canada

Filed Oct. 21, 1973, Ser. No. 191,221
Int. Cl. H04r 19/02
U.S. Cl. 179—111 R **12 Claims**



An Acoustic Wavefront Modifying Device can be used with acoustic waves having audio frequencies within the range of human hearing as a lens or prism. The device comprises an enclosure having at least a portion of its surface space acoustically transparent and having therein a gas in which the speed of sound differs from the speed of sound in the ambient gas. The device is most particularly embodied in an electrostatic loudspeaker having one or a plurality of electrostatic transducer units within a gas enclosure and having acoustically transparent front and back surfaces. The gas is usually sulphurhexafluoride or perfluoropropane or a mixture of them or either of them with air.

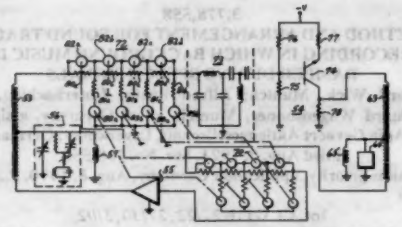
3,778,563

VOICE FREQUENCY REPEATER

Donald L. Bise, Tustin, and Ronald J. Surprenant, Anaheim, both of Calif., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Mar. 29, 1972, Ser. No. 239,026
Int. Cl. H04b 3/36
U.S. Cl. 179—170 R **3 Claims**

A repeater useful in 2-wire line telephone systems employs a pair of hybrid sets, each of which is rotated 90 degrees relative to the normal operation position. A relatively small hybrid set having a relatively low inductance has an inductor connected in the secondary, which has an inductance related to the inductance of the primary, to eliminate the need for the retard coils typically employed in the direct current line for repeaters, and also the need for isolation transformers. Consequently, the repeater is relatively economical and smaller in size. An attenuator employing L half-sections in the input of each amplifier provides direct reading gain and a bandpass amplifier in the input of each amplifier provides increased stability by eliminating the high and low frequencies outside the voice frequency band.

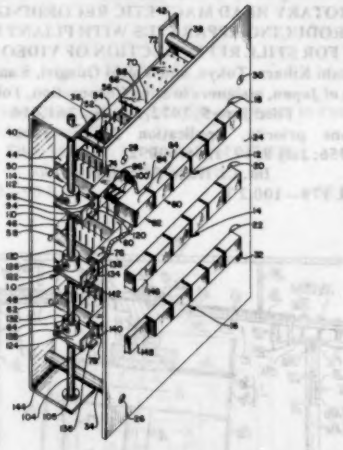


3,778,564

SWITCH RESETTING APPARATUS FOR MULTI-BANK PUSH BUTTON SWITCHES

William F. Nocella, Philadelphia, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed July 7, 1972, Ser. No. 269,820
Int. Cl. H01h 9/26
U.S. Cl. 200—5 R **7 Claims**



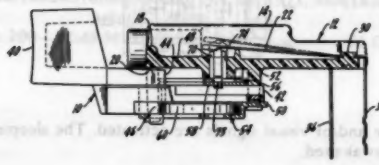
A unitary reset linkage for a multiple-bank push button switch has a shaft and a plurality of associated levers to transmit latch bar motion from one bank of switches to another thereby to expedite clearing of the banks when switching from one bank to another.

3,778,565

POWER RATED PUSHBUTTON SWITCH WITH SLIDE BAR AND WASHER TYPE BLOCKOUT INTERLOCK STRUCTURE

Raymond F. Lewandowski, Mount Prospect, and William C. Markison, Crystal Lake, both of Ill., assignors to Oak Industries Inc., Crystal Lake, Ill.

Filed Oct. 5, 1972, Ser. No. 295,185
Int. Cl. H01h 9/26
U.S. Cl. 200—5 E 27 Claims



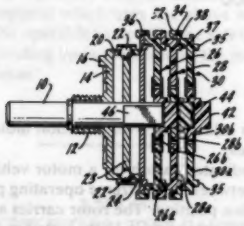
A plurality of pushbuttons are mounted in a switch frame, with each button being arranged to move contacts between open and closed positions. A pair of slide bars are positioned for movement in the frame in a path generally perpendicular to the paths of movement of the buttons. There are followers, which move in response to actuation by the slide bars, for opening and closing the contacts. Washers are positioned between adjacent pushbuttons for performing a blockout function.

3,778,566

MULTISECTION ROTARY WAFER TYPE SWITCH ASSEMBLY WITH INTERLOCKING STATOR AND ROTOR SECTIONS

Vladas Gusaras, Madison, Wis., assignor to Oak Industries Inc., Crystal Lake, Ill.

Filed Nov. 6, 1972, Ser. No. 304,197
Int. Cl. H01h 19/58
U.S. Cl. 200—14 8 Claims



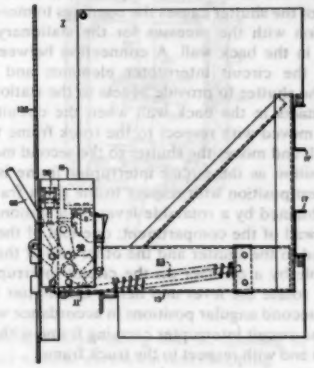
A rotary switch construction includes a plurality of generally identical switch sections and a switch shaft of fixed length. There are interlocking means between the stators and rotors of each of the switch sections, with one of the rotors interlocking with the switch shaft. Thus, any number of switch sections may be connected to the fixed length shaft through the interlocking arrangement between the rotors with the advantage that a single length shaft can provide rotary movement of different numbers of switch rotors.

3,778,567

CIRCUIT INTERRUPTER WITH INTERLOCKING MECHANISM

Norman Davies, Trafford, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 4, 1972, Ser. No. 277,954
Int. Cl. H01h 9/22
U.S. Cl. 200—50 A 10 Claims



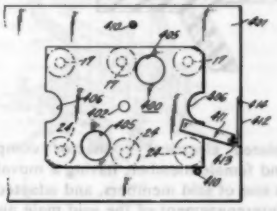
A circuit interrupter with an interlocking system is provided with stored energy overcenter spring operating means for operating the interrupter between open and closed positions. A latch device latches the operating means in charged positions for the opening and closing operations. An interlocking system provides adequate safety to operating personnel by rendering the latch device inoperable when an enclosure door is opened, or to prevent opening of the door when the interrupter is in the closed position.

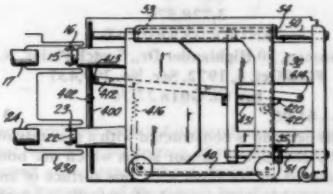
3,778,568

DRAW OUT SWITCHGEAR-COMPARTMENT SHUTTER

George A. Wilson, Pineville, Pa., assignor to ITE Imperial Corporation, Philadelphia, Pa.

Filed Aug. 21, 1972, Ser. No. 282,325
Int. Cl. H01h 9/22
U.S. Cl. 200—50 AA 4 Claims





A switchboard cubicle compartment disconnect contact shutter in which a plurality of stationary disconnect contacts

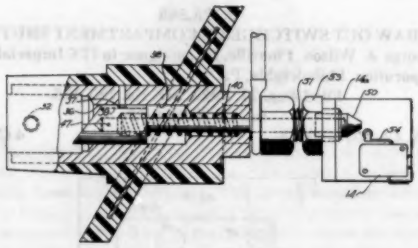
are mounted in recesses in a back wall of the compartment and a truck mounted circuit interrupter is introducible into a compartment, the truck mounted circuit breaker having a frame movable with respect to the truck frame toward and away from the disconnects in the back wall. The shutter structure is rotatably mounted on the back wall and has openings therein; one angular position of the shutter causes the openings to register with the recesses for the stationary disconnect contacts in the compartment; a second angular position of the shutter causes the openings to move away from registration with the recesses for the stationary disconnect contacts in the back wall. A connection between the frame carrying the circuit interrupter elements and the shutter rotates the shutter to provide access to the stationary disconnect contacts in the back wall when the circuit interrupter frame is moved with respect to the truck frame towards said back wall; and moves the shutter to the second mentioned angular position as the circuit interrupter frame is racked out toward test position with respect to the truck frame. This action is obtained by a rotatable lever on a stationary pivot on the side wall of the compartment; one end of the lever being connected to the shutter and the other end of the lever being engageable by a member on the circuit interrupter carrying frame to rotate the lever and hence the shutter between the first and second angular positions in accordance with the location of the circuit interrupter carrying frame within said compartment and with respect to the truck frame.

3,778,569

ELECTRICAL CONNECTOR WITH SAFETY SWITCH

Albert P. Newman, and Clem Edward Haun, both of Cincinnati, Ohio, assignors to Empire Products, Inc., Cincinnati, Ohio

Filed Dec. 30, 1971, Ser. No. 213,943
Int. Cl. H01r *33/30*
U.S. Cl. 200—51.09 **9 Claims**



An insulated electrical connector comprising a male member and female member, having a movable member integral with one of said members, and adapted for movement upon the interengagment of the said male and female members, said movement causing the activation of a series connected current interrupting switch.

3,778,570

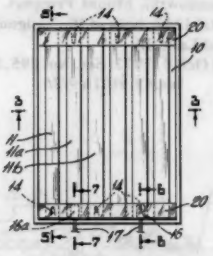
ENURESIS BED PAD

Joseph G. Shuman, 20 Highlander Dr., Scotch Plains, N.J.

Filed Oct. 5, 1972, Ser. No. 299,437
Int. Cl. G01n *27/30*
U.S. Cl. 200—61.05 **3 Claims**

An enuresis bed pad is constructed with a plurality of parellel electrically conductive sensor strips which are bonded to but not embedded in, nor flush with, one surface of an essentially non-stretchable, water-proof, electrically insulative substrate. The sensor strips are spaced on the substrate so that they are normally electrically insulated. The complete structure is relatively thin, flexible and crease resistant.

When any two adjacent sensor strips are bridged electrically by the electrolytes in urine, an external circuit is closed and



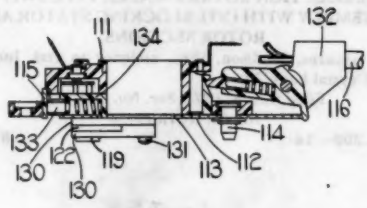
audible and/or visual signals are activated. The sleeping person is awakened.

3,778,571

DIRECTION INDICATOR SWITCHES FOR ROAD VEHICLES

Edward Cryer, Higham, near Burnley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Mar. 1, 1972, Ser. No. 230,600
Claims priority, application Great Britain, Mar. 20, 1971, 7,540/71
Int. Cl. H01h *3/16*
U.S. Cl. 200—61.35 **8 Claims**



This invention relates to novel direction indicator switches for motor vehicles.

A direction indicator switch for a motor vehicle includes a rotor movable between two extreme operating positions and a central inoperative position. The rotor carries a pair of spring loaded pawls for engagement with a striker on a steering column of the motor vehicle. Each pawl has a slot therein through which passes a post on the pawl. A ball is carried in each slot and is movable in a profiled recess in the rotor so that movement of each pawl relative to the rotor is permitted in one direction to allow movement of the striker without movement of the rotor but is opposed in the other direction to permit movement of the rotor to its central position by one of the strikers moving in a switch cancelling direction when the rotor is not manually retained in one of its operating positions.

The switch provides an improved means whereby manual retention of the switch in an operative position is permitted when a switch cancelling movement of the striker occurs.

3,778,572

INERTIA SENSOR SWITCH ASSEMBLIES WITH MAGNETIC HOLDING MEANS OR THE LIKE

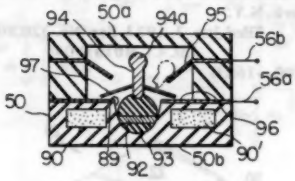
Shunji Matsui; Kenzo Hirashima, both of Yokohama; Yoshikazu Hayakawa, Yokosuka, and Nagayuki Marumo, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Mar. 22, 1972, Ser. No. 237,005

Claims priority, application Japan, Mar. 25, 1971, 46/21178 (utility model); Mar. 26, 1971, 46/21002 (utility model); Mar. 31, 1971, 46/23476 (utility model); June 24, 1971, 46/54615 (utility model); July 31, 1971, 46/68595 (utility model); Oct. 14, 1971, 46/94666 (utility model); Oct. 28, 1971, 46/100203 (utility model); Oct. 16, 1971, 46/81824

Int. Cl. H01h *35/14*

U.S. Cl. 200—61.45 M 56 Claims



An impact detecting device for use in a motor vehicle safety device, in which the detecting device is made up of a movable contact assembly having a conductive weight which is rockingly suspended in a housing by a conductive support means, a stationary contact assembly having at least a conductive contact member which is in alignment with the weight, and a biasing means such as a magnet which urges the weight, by a predetermined biasing force, to a rest position which is spaced apart from the contact member of the stationary contact assembly. When a force of inertia greater than a predetermined magnitude overcoming the biasing force is applied to the weight, then the weight is moved from the rest position to contact the contact member to the stationary contact assembly whereby electrical connection is established between the movable and stationary contact assemblies. An arrangement is also proposed which uses the above noted detecting device so as to be operable to actuate the safety device at different rates depending upon the speed of the motor vehicle involved in a collision.

3,778,573

VACUUM CIRCUIT INTERRUPTER HAVING IMPROVED CONTACT STRUCTURE

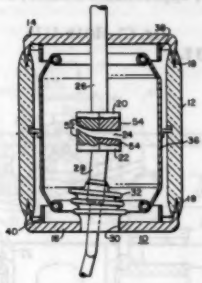
Ronald T. Harrold, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 23, 1972, Ser. No. 265,904

Int. Cl. H01h *33/66*

U.S. Cl. 200—144 B 9 Claims

A vacuum type circuit interrupter is provided having a contact structure comprising separable mating contacts. The contact structure is constructed so that the mating contacts close on a first material and open on a second material. The first material on which the mating contacts close is made from weld free material so that contact welding does not occur when the vacuum interrupter is closed. The second material on which the contacts open, possesses good contact opening characteristics and interrupting that is, opening of the contacts will occur without excess current chopping.



3,778,574

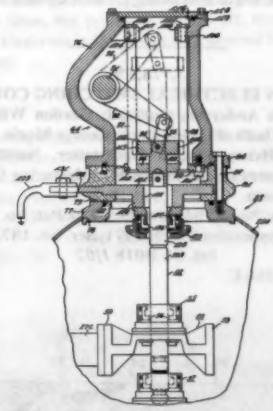
GROUND-TEST SWITCH

Thomas F. Clark, Canton, Mass., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed June 26, 1972, Ser. No. 266,253

Int. Cl. H01h *33/70*

U.S. Cl. 200—148 B 14 Claims



A ground and test switch for metal enclosed gas insulated switchgear which allows testing of the internal conditions of the enclosed switchgear without draining the insulating gas therefrom. Operation of the circuit breaker contacts, contact resistance measurement, high voltage insulation testing, and other electrical and/or mechanical tests requiring connection to the high voltage conductor may be made.

3,778,575

CIRCUIT CONTROL SWITCH WITH CONTACT BRIDGE SPRING BIASED TOWARDS FIXED CONTACT

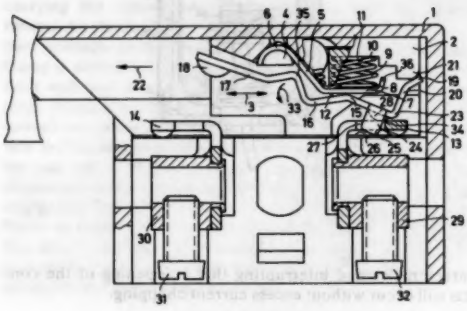
Fritz Prestel, Rietheim, Germany, assignor to Firma J & J Marquardt, Rutheim, Germany

Filed June 5, 1972, Ser. No. 259,405

Claims priority, application Germany, June 16, 1971, P 21 29 823.7

Int. Cl. H01h *1/36*

U.S. Cl. 200—153 LA **4 Claims**



In an electric switch having at least one movable contact bridge and, associated with each contact bridge and cooperating therewith, two serially-disposed fixed contacts, the contact bridge being of angular construction, one spring-loaded angle arm, in the open switch position, being inclined with respect to a line defined by the contact surfaces, while the other can be coupled to a thrust member, the improvement comprising the contact bridge being provided with one or a plurality of mutually parallel supporting lugs extending opposite to the direction of the other arm and through which the contact bridge particularly in the region of the corner, and being supported on a tilting and sliding plane, and a face or edge of the supporting lug which is directed opposite to the free end of one angle arm being pressed against a fixed abutment.

3,778,576

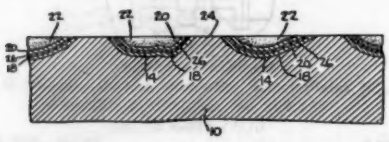
TUNGSTEN ELECTRICAL SWITCHING CONTACTS

Harold Francis Anderson, Guilford; Gordon William Shove, Mt. Carmel, both of Conn.; Louis George Morin, Tarrytown, N.Y., and Henry Clinton Gackstetter, North Branford, Conn., assignors to The Echlin Manufacturing Corporation, Branford, Conn.

Division of Ser. No. 6,784, Jan. 29, 1970, Pat. No. 3,671,314. This application Oct. 7, 1971, Ser. No. 187,555

Int. Cl. H01h *1/02*

U.S. Cl. 200—166 C **14 Claims**



A tungsten contact disc is treated by burnishing so as to smooth and compact the contact surface and remove the surface-crazed metals and oxides, while simultaneously filling the surface pores with a contaminant such as iron. The contaminants present in the pores are subsequently removed by immersing the contact disc in a dissolving agent, and the remaining natural oxides of the tungsten are removed from the walls of the pores by cathodic reduction, so as to create large pore sites which are free of oxides and contaminants. Next, there is applied a coating of a diffusion-absorbing metal, such as nickel, to the contact disc to provide a diffusion-absorbing layer for an outer film of gold. The gold lining the pore sites is applied with a thickness sufficient to maintain an amount of non-alloyed gold on the contact surface after some of the gold has been diffusion absorbed by the underlying nickel layer. During electrical switching operations, the gold alloys with the nickel, and the gold and gold alloy lining the pore surfaces are effective to prevent oxide formation on the pore surfaces and to substantially reduce surface destruction by the arc heat, thereby affording a longer contact operating life.

3,778,577

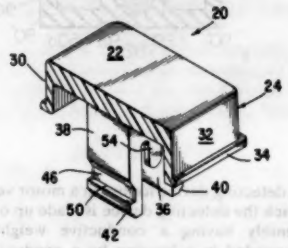
MOISTURE SEALING DEVICE FOR TOGGLE SWITCHES

Charles Thomas Fromknecht, Anderson, and John C. Davis, Greenwood, both of S.C., assignors to The Singer Company, New York, N.Y.

Filed Jan. 3, 1973, Ser. No. 320,800

Int. Cl. H01h *9/04*

U.S. Cl. 200—168 G **13 Claims**



A cap and wall structure for sealing a toggle switch against entry of moisture. The cap comprises an annular skirt encapsulating an annular wall formed about an opening in the wall structure or cover plate. The cap includes a pair of legs which lock it to the wall or plate but allows the cap to slide while a pair of tabs entrap the switch actuating member to actuate the same in response to movement of the cap.

3,778,578

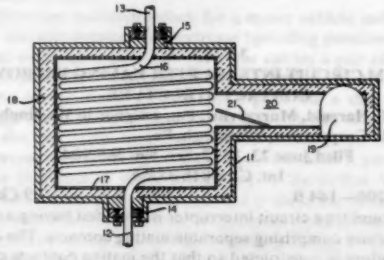
APPARATUS FOR PRODUCING SUPER HEATED FLUIDS

Raymond E. Long, 26323 Ridge Rd., Damascus, Md., and Ralph C. Boles, Jr., 12005 Claridge Rd., Wheaton, Md.

Filed Nov. 10, 1971, Ser. No. 197,422

Int. Cl. H05b *9/06*; B60k *3/00*

U.S. Cl. 219—10.55 **7 Claims**



The disclosure relates to an apparatus for producing super heated fluids by converting electromagnetic energy into ther-

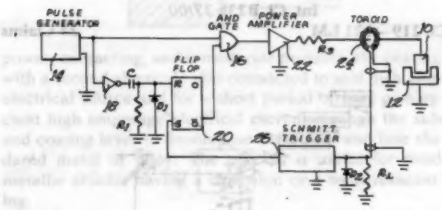
mal energy within the fluid. A coil of low dielectric tubing is placed in a microwave resonant chamber and extends from a fluid inlet to a vapor outlet. The fluid to be super heated passes through the coil and is vaporized directly by microwave energy. The invention is particularly applicable to a vapor powered vehicle that produces no environmental pollution.

3,778,579

ARC CONTROL

Eiichi Takarada, Rockford, Ill., assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed Apr. 27, 1972, Ser. No. 248,271
Int. Cl. B23p 1/08
U.S. Cl. 219—69 S **3 Claims**



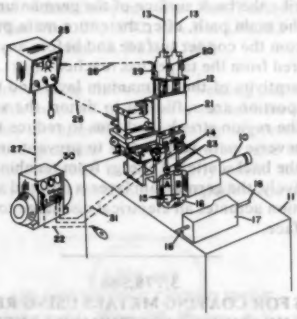
A toroid senses the time rate of change of current at the gap between an electrode and a workpiece in an electrical discharge machining apparatus. An abnormal time rate of change of current causes a signal to be developed by a Schmitt trigger, which causes interruption of power flow to the gap.

3,778,580

METHOD FOR PROVIDING ALLOYED ZONES ON A HARDFACED WORKPIECE

Stanton F. Bierwith, San Leandro, Calif., assignor to Great Canadian Oil Sands, Limited, Toronto, Canada

Filed Mar. 29, 1972, Ser. No. 239,071
Int. Cl. B23h 9/18
U.S. Cl. 219—73 **2 Claims**



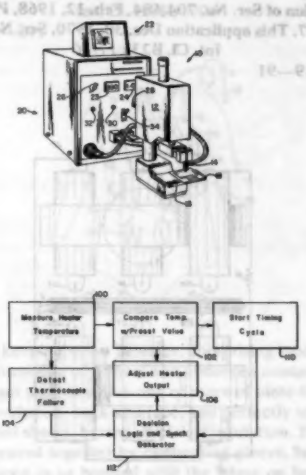
A method for hardfacing a metal workpiece to provide a hardfaced work surface varying in composition over a cross section of the face thereof said method utilizing consumable guide nozzles and electroslag welding procedures.

3,778,581

TIME-AT-TEMPERATURE A-C REFLOW SOLDERING POWER SUPPLY

Bradley J. Denny, Vista, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 3, 1972, Ser. No. 277,849
Int. Cl. B23k 1/02
U.S. Cl. 219—85 **3 Claims**



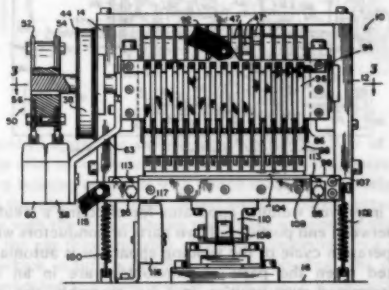
An improved a-c power supply for use in a reflow soldering system is disclosed. The output from a thermocouple attached to the heater bar is amplified and compared to a preset reference voltage. This controls the rate at which a-c current is fed to the heater and thus controls the heater temperature. A timing circuit synchronized to the line frequency is activated when the heater temperature reaches its preset value. A fail-safe shutdown circuit is provided to disable the output should one of the thermocouple leads break. Furthermore, should the heater not reach the desired temperature within a reasonable time, the power is turned off, thereby protecting the circuit elements in the event of a shorted heater or cabling to the heater.

3,778,582

MATERIAL WORKING MACHINE

Jacob D. Schiller; Scott L. Cheslik, both of Indianapolis, and J. Tim Gonzales, Carmel, all of Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Oct. 14, 1971, Ser. No. 189,429
Int. Cl. B23k 11/10
U.S. Cl. 219—87 **3 Claims**



A bank of individual working tools are selectively movable in response to movement of a cam means, the working tools

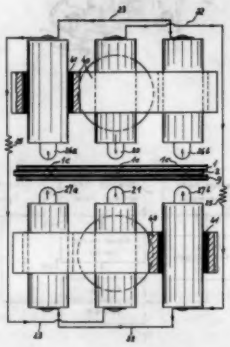
being counterbalanced to regulate the pressure at which they engage a workpiece.

3,778,583

RESISTANCE WELDING OF SHEET METAL COATED WITH LAYERS

Otto Alfred Becker, 59 Robert-Koch-Strasse, Saarbrucken, Germany

Division of Ser. No. 704,684, Feb. 12, 1968, Pat. No. 3,643,057. This application Dec. 30, 1970, Ser. No. 102,951
Int. Cl. B23k *11/10*
U.S. Cl. 219—91 **3 Claims**



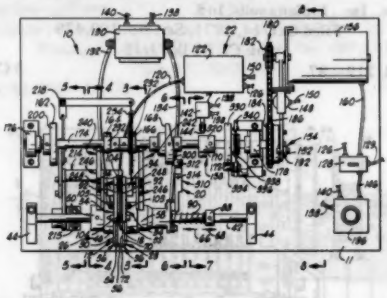
The invention relates to a method for the resistance welding of sheet metal coated with layers, wherein firstly electrical contact is established between the sheets to be interwelded and between the welding electrodes and said sheets, and subsequently welding is effected across the coating layers. The invention relates also to machines for carrying out this method.

3,778,584

APPARATUS FOR CLAMPING AND ALIGNING PARTS FOR WELDING

John Fajt, and James V. Neal, Jr., both of Pauls Valley, Okla., assignors to El-Tronics, Inc., Cherry Hill, N.J.

Filed Jan. 10, 1972, Ser. No. 216,494
Int. Cl. B23k *9/02*
U.S. Cl. 219—101 **23 Claims**



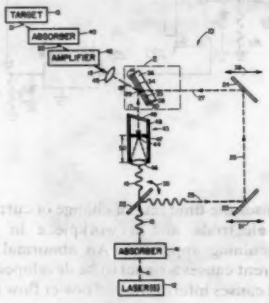
An improved welding apparatus for effecting a weld junction between end portions of two parts or conductors wherein the operation cycle of the welding apparatus is automatically initiated when the parts or conductors are in an initial, predetermined start position in a jaw assembly, the jaw assembly being then automatically positioned to securedly hold the parts or conductors as the parts or conductors are automatically positioned in a predetermined overlapping, welding position. The welding cycle is automatically initiated subsequent to the parts or conductors being positioned in the welding position to effect the weld junction therebetween, and the joined parts or conductors are then automatically ejected from the welding apparatus, the welding apparatus being then automatically positioned in the start position for receiving subsequent parts or conductors to be joined via a weld junction.

3,778,585

PROTECTION DEVICE FOR PREVENTING DAMAGE TO RADIATION SOURCE FROM BACKSCATTER

Philip J. Mallozzi; Harold M. Epstein; Craig T. Walters; David C. Applebaum, all of Columbus, and William J. Gallagher, Worthington, all of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Apr. 21, 1972, Ser. No. 246,161
Int. Cl. B23k *27/00*
U.S. Cl. 219—121 LM **34 Claims**



Methods and apparatus for directing an incident radiation pulse from a laser to a target and preventing any substantial backscattering of the radiation along the reverse path.

A beam splitter directs a major portion of the incident pulse energy in a main path beginning in one direction and a minor portion in a secondary path beginning in a different direction.

The front surface of a layer of copper having high reflectivity is located in the main path to direct the major energy portion on to the target, and a layer of germanium having high absorptivity to the radiation is located with its front surface adjacent the back surface of the copper layer. Mirrors in the secondary path direct the minor energy portion over a longer route to strike the back surface of the germanium layer in the region of the main path, after the entire main pulse has been reflected from the copper surface and before any pulse energy backscattered from the target has reached it.

The absorptivity of the germanium layer and the energy of the minor portion are sufficient to distort the surface of the copper in the region struck, and thus to reduce the reflection along the reverse path sufficiently to prevent any substantial portion of the backscattered energy from reaching the laser.

Alternatively, the germanium layer is omitted and the minor energy portion actuates an electrical discharge to vaporize the copper surface.

3,778,586

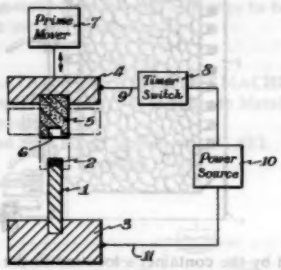
PROCESS FOR COATING METALS USING RESISTANCE HEATING OF PREFORMED LAYER

Ernest J. Breton, and Dexter Worden, both of Wilmington, Del., assignors to Composite Sciences, Inc., Wilmington, Del.

Filed Apr. 2, 1970, Ser. No. 25,090
Int. Cl. B23k *9/04*
U.S. Cl. 219—76 **16 Claims**

An improved process for coating a metal substrate with a metallic coating or an abrasive-filled metallic coating metal-

lurgically bonded to the substrate comprising placing on a metal substrate a coating layer having a desired thickness said layer comprising a mixture of a powdered metal or alloy and a binder or a mixture of a powdered metal or alloy, powdered abrasive and a binder; contacting the metal substrate with an electrode connected to a source of high amperage electrical



power; contacting, under moderate pressure, the coating layer with a second electrode also connected to said high amperage electrical source and for a short period of timg passing sufficient high amperage electrical current through the substrate and coating layer to decompose the binder and fuse the powdered metal or alloy. The process is useful for producing metallic articles having a corrosion or a wear-resistant coating.

3,778,587

CORED WIRE ELECTRODE HAVING 200 TO 2000 PPMO$_2$

Robert A. Kubli, Scotch Plains, N.J.; Frederick H. Sasse, Yorktown Heights, N.Y.; Gerald D. Uttrachi, Westfield, N.J.; Le Roy L. Van Dyke, Mahopac, and Masahiro Nakabayashi, Dobbs Ferry, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 27, 1971, Ser. No. 212,756

Int. Cl. B23k *35/22*

U.S. Cl. 219—146 **5 Claims**

A hollow tubular sheath containing manganese and silicon ingredients with iron powder, the total wire chemistry containing between 200 and 2000 parts per million oxygen.

3,778,588

SELF-SHIELDING CORED WIRE TO WELD CAST IRON

Robert Anthony Bishel, Huntington, W. Va., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Mar. 29, 1972, Ser. No. 239,351

Int. Cl. B23k *35/22*

U.S. Cl. 219—146 **8 Claims**

A cored wire welding electrode for welding cast iron having an outer sheath made of nickel or a nickel-iron alloy and a powdered core composition containing copresent metallic magnesium and graphite and slag-forming and alloying ingredients. The electrode is particularly useful for open-arc welding of cast iron to itself and to compatible metals.

3,778,589

AIR OPERATING CORED WIRE

Masahiro Nakabayashi, Briarcliff Manor, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed July 31, 1972, Ser. No. 276,779

Int. Cl. B23k *35/22*

U.S. Cl. 219—146 **7 Claims**

A cored wire electrode for welding in air containing as major core materials Potassium Oxalate $K_2C_2O_4$; Magnesium Mg; and Manganese Oxide MnO.

3,778,590

SUIT FOR KEEPING WARMTH IN WATER

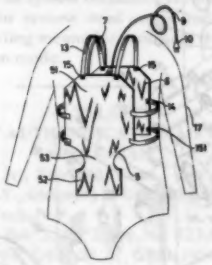
Toru Iizuka; Katsuo Tonooka, both of Ashikaga; Torahiko Saitoh, Tokyo, and Isao Yasuda, Ashikaga, all of Japan, assignors to Kohkoku Chemical Industry Co., Ltd., Tokyo, Japan

Filed May 24, 1972, Ser. No. 256,282

Claims priority, application Japan, June 2, 1971, 47/38378; Jan. 12, 1972, 47/5660; July 20, 1971, 46/63483

Int. Cl. H05b *3/04*

U.S. Cl. 219—211 **10 Claims**



A suit for keeping warm in water, comprising basic warming materials, consisting of a chest and abdomen contact part and a back contact part, in which one or more of plate-like heating units are enveloped, back and face, and perfectly sealed within water-proof sheets, having electrical insulation. The contact parts are secured together by connecting pieces, both ends of which are sewn in or bonded with the edges on both ends of the basic materials. Water-proof electric wires connect the enveloped plate-like heating units with each other, and a lead wire connects the water-proof electric wire with an electric source for generating heat to keep warm.

3,778,591

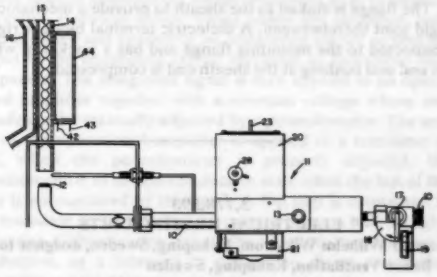
CONTROL APPARATUS FOR A COOLING DEVICE

Johan Ragnar Ellstrom, Bromma, Sweden, assignor to Junkers & Co. G.m.b.H., Wernau, Germany

Filed June 28, 1971, Ser. No. 157,219

Int. Cl. F25b *27/00*

U.S. Cl. 219—279 **7 Claims**

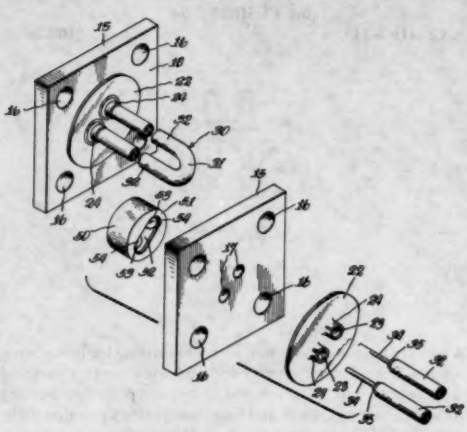


A control apparatus designed to control the flow of a gas from an inlet to an outlet is shown. The control apparatus includes a housing provided with switch means operatively connected thereto. A gas filled closed member is connected to a bellows with the bellows being responsive to pressure changes within the gas filled member. A gear is connected to a worm screw which in turn is connected to the housing. The gear is also connected to a valve spindle which in turn is connected to control mechanism and to a selectively openable and closeable valve.

3,778,592
ELECTRIC HEATING ASSEMBLIES

Michael Williams, Warren, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.

Filed Nov. 16, 1972, Ser. No. 307,108
Int. Cl. F24h *1/00;* **H05b** *1/00*
U.S. Cl. 219—336 **7 Claims**



The invention relates particularly to an electric immersion heater for use in heating liquid in a tank, such as a hot water tank. The heater includes the standard construction of a mounting flange and a sheathed heating element rigidly carried by the flange in cantilever fashion so that it may be positioned through a tank opening and in contact with the liquid to be heated.

A corrosion shield overlies the flange surface which is exposed to the liquid in the tank, the shield having a collar through which an end of the heater sheath passes, such end also passing through an opening in the mounting flange. The collar is deformed radially inwardly against the wall surface of the sheath, the deformation causing the wall of the collar to be reduced in cross-section and substantially cold welded to the sheath to form a liquid-tight joint therewith.

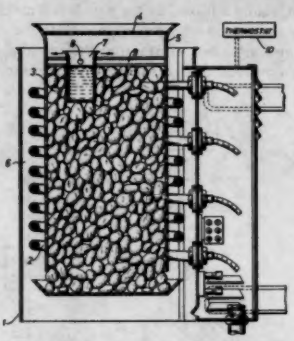
The flange is staked to the sheath to provide a mechanically rigid joint therebetween. A dielectric terminal block is rigidly connected to the mounting flange and has a pocket in which an end seal bushing at the sheath end is compressed.

3,778,593
ELECTRICAL HEATING UNITS

Gunnar Wilhelm Wikstrom, Enkoping, Sweden, assignor to AB Bahco Ventilation, Enkoping, Sweden

Filed Nov. 2, 1971, Ser. No. 194,975
Claims priority, application Sweden, Nov. 3, 1970, 14847/70
Int. Cl. H05b *1/00;* **A61h** *33/06;* **F24h** *7/02*
U.S. Cl. 219—362 **3 Claims**

A steam bath unit is disclosed including a heat accumulator comprising a stone magazine located in a container, the walls of the container being surrounded by an electrical heating element. The temperature to which the stones are to be heated by the element is set by a thermostat. An open water container is partially submerged in the stone magazine. The water container is so mounted that its lateral location relative to the walls of the container may be varied. As the water in the container is heated essentially by heat received from the surrounding stones, the time at which the water boils is thereby

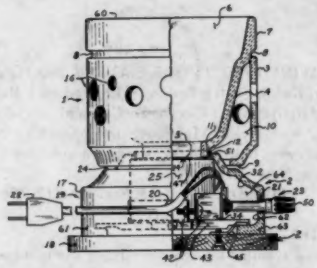


controlled by the container's location in the stone magazine i.e., the time at which the surrounding stones are heated.

3,778,594
POSITIVE LIQUID TEMPERATURE CONTROLLING DEVICE

John W. Wightman, 3 Ridgecreek, St. Louis, Mo.

Continuation-in-part of Ser. No. 111,185, Feb. 1, 1971, abandoned. This application Oct. 16, 1972, Ser. No. 297,799
Int. Cl. F27d *11/02*
U.S. Cl. 219—430 **4 Claims**

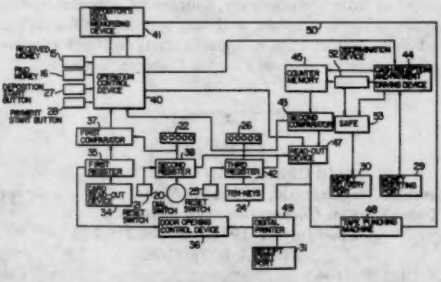


A cup and base combination is provided by which liquid contents of the cup can be maintained at a desired potable temperature at every level of the liquid.

3,778,595
AUTOMATIC TELLER SYSTEM

Yoshihiro Hatanaka, and Akio Ueba, both of Himeji, Japan, assignors to Kabushiki Kaisha Kokuei Kikai Seisakusho, Himeji-shi, Hyogo-ken, Japan

Filed Oct. 15, 1971, Ser. No. 189,646
Claims priority, application Japan, Oct. 17, 1970, 45/91425
Int. Cl. G06r *7/01*
U.S. Cl. 235—61.7 B **5 Claims**



An automatic bank teller system comprises means for reading out a depositor's code from a card of a user, means operated by the user for selecting the operation of the system

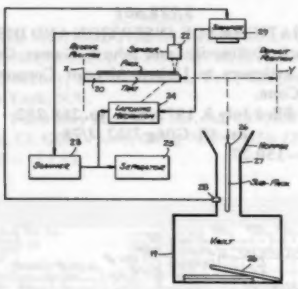
between reception and payment of money, means also operated by the user for designating a sum of money to be received or paid, means for memorizing the bank file of depositors' accounts to send out the depositor's account in correspondence to the read-out code from the card, and means for receiving or paying the desired sum of money upon confirmation of the balance as calculated from the output of said memorizing means and the sum of money to be received by or paid to the user of the teller system.

3,778,596

AUTOMATIC BANKING DEPOSIT MACHINE

Joseph S. Wapner, Levittown, Pa., assignor to Metalogics Corporation, Chicago, Ill.

Filed Sept. 20, 1971, Ser. No. 181,882
Int. Cl. G06k *17/00*
U.S. Cl. 235—61.9 R **13 Claims**



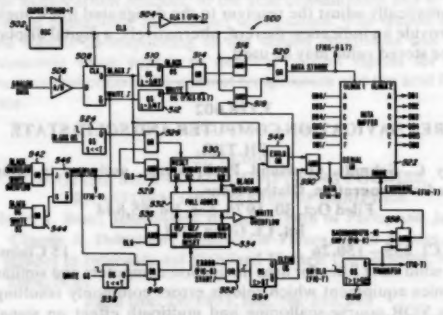
An automatic banking deposit machine adapted to accept a deposit pack constituted by an envelope containing the items to be deposited and a deposit-slip assembly adhered to the face of the envelope and including an original slip on which the items to be deposited are entered, and a duplicate slip separable from the pack. When the pack is placed on the machine, the filled envelope and the original deposit slip adhered thereto are separated from the duplicate slip and fed into a locked vault, whereas the duplicate slip is stamped with receipt data and returned to the depositor.

3,778,597

RECORD READING SYSTEM

James L. Vanderpool, Centerville, and Bruce W. Dobras, Dayton, both of Ohio, assignors to The Monarch Marking Systems Company, Dayton, Ohio

Filed Jan. 8, 1971, Ser. No. 105,007
Int. Cl. G06k *7/14*
U.S. Cl. 235—61.11 E **5 Claims**



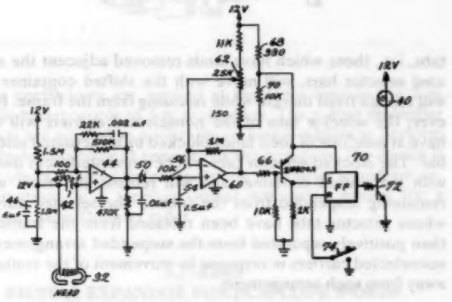
A machine-readable record or label includes alternating areas or bars of different reflectivity whose relative widths are varied to provide a binary coded data record. The record includes start and stop codes between which is recorded a plural character message capable of being read in forward and backward directions. A record interpreting system compares the widths of consecutive bars and, by reference to the sequence in which the bars are read, enters binary "0"s and "1"s into a shift register. The system includes a detector that continuously samples the shift register contents for a start indication and, on detection thereof, stores a start and the direction of reading. This changes the system from a scan mode to a read mode in which the contents of the shift register are transferred to a display only as each complete character code is received. The system includes a reversing and complementing control for reverse read codes and both error and message end detecting means for returning the system from a read mode to a scan mode.

3,778,598

DOCUMENT AUTHENTICATION METHOD AND APPARATUS

David H. Eberly, Jr., Fairfield, Conn., and Peter E. Hanke, White Plains, N.Y., assignors to United States Banknote Corporation, New York, N.Y.

Filed Feb. 3, 1972, Ser. No. 223,079
Int. Cl. G06k *7/08*; G01r *33/12*; G06k *19/06*; G11b *5/70*
U.S. Cl. 235—61.11 D **6 Claims**



A method and apparatus for authenticating a document having intaglio printing such as a stock certificate, currency or security stamp, whereby a magnetic head is passed over successive lines of magnetic ink on the document so as to produce successive electrical pulses. These pulses are amplified, half-wave rectified and applied to an integrating circuit so that the output of the integrating circuit increases as successive lines are passed. The integrated signal is then applied to an operational amplifier together with a constant voltage whose amplitude can be manually adjusted by a potentiometer. The output of the operational amplifier is applied to a transistor so that, when the potentiometer is properly adjusted, the transistor shifts to its non-conductive state when the last of the lines is encountered by the head. A flip flop is connected to the transistor so that it changes state to cause a bulb to light, indicating authentication, when the transistor becomes non-conductive, or a solenoid to operate to divert counterfeit documents or products.

3,778,599

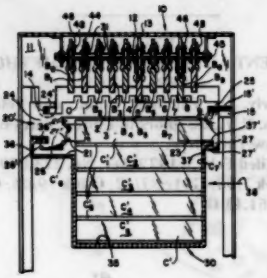
INFORMATION CARRIER SELECTION SYSTEM

Norman J. Rosenburgh, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 36,821, May 13, 1970, Pat. No. 3,647,064. This application Aug. 23, 1971, Ser. No. 174,247
Int. Cl. B07c *9/00*; G06k *21/00*
U.S. Cl. 235—61.12 R **3 Claims**

An apparatus for positively separating preselected information carriers from an arrangement of similar carriers, includes

a frame and a container, and is adapted to be used with a plurality of selector tabs releasably suspended from the frame and releasably suspending the container. A plurality of information carriers are symmetrically supported within the container and are respectively connected in sliding frictional relation to the selector tabs. Each selector tab has an edge configuration of alternative lands and notches that is coded to identify a respectively connected carrier by removing preselected of such lands. To make a selection, appropriate selector bars on the frame are actuated to a blocking position within corresponding notches of the coded selector tabs, and the container is shifted one notch pitch. The selected carrier selector



tabs, i.e., those which have lands removed adjacent the actuated selector bars, will move with the shifted container and will remain fixed thereto while releasing from the frame. However, the selector tabs of the nonselected carriers will each have at least one of their lands blocked by an actuated selector bar. The blocked selector tabs will be prevented from moving with the shifted container and will release therefrom while remaining suspended from the frame. The selected carriers whose selector tabs have been released from the frame are then positively separated from the suspended arrangement of nonselected carriers in response to movement of the container away from such arrangement.

3,778,600

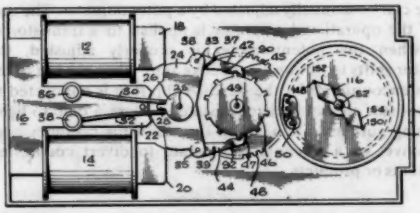
MODULAR COUNTER CARRY CIRCUIT

John S. Burton, 11349 Elderwood St., Los Angeles, Calif.

Continuation-in-part of Ser. No. 66,036, Aug. 21, 1970. This application Mar. 15, 1972, Ser. No. 234,976

Int. Cl. G06m *1/276, 3/14*

U.S. Cl. 235—92 C **10 Claims**



Herein described is a carry circuit used with pulse counters which convey carry information from one module of a digit counter to an associated module as, for example, in a decade counter. A commutator associated with one digit is energized by a pair of brushes which are rotated by the count wheel thereof. The count wheel is designed to start its rotational indexing movement only after termination of an input count pulse, thereby causing the brushes to rotate only when current has ceased to be applied to the circuit. The counter includes, for example, an add coil and a subtract coil. The commutator includes a segment coupled to the add coil on the next preceding digit counter and a segment coupled to the subtract coil of the next preceding digit coil. When the index wheel is moved into a nine position, the brushes and commutator are simultaneously aligned to provide for actuation of the next decade counter simultaneously with the first decade counter upon receipt of an additional add pulse. Upon removal of such pulse, the first decade wheel moves from nine to zero, while the second decade wheel moves one increment. Stepping of additional decade wheels are likewise provided for. Likewise, receipt of a subtract pulse when the index wheel is moved into a zero position would cause a reverse rotation in applicable decade wheels due to the particular design and alignment of the brushes and commutator.

3,778,601

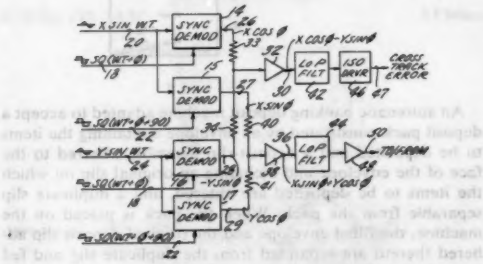
AUTOMATIC TRACK INSERTION AND DISPLAY

Larry D. Brock, Collinsville, and John E. Games, Granby, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed July 3, 1972, Ser. No. 268,252

Int. Cl. G06g *7/22, 7/78*

U.S. Cl. 235—150.27 **4 Claims**



Digital values of designated track angles for various portions of a preplanned flight are presented by a storage unit for different segments of the flight plan. These values are converted to quadrature square waves of a phase related to the designated track angle, which are used to synchronously demodulate sinusoidal signals of X and Y coordinates from the aircraft to a way point relating to the flight plan segment, the result being combined to provide along-track distance to way point and cross track error. The square wave signals may be used to drive a conventional differential resolver so as to automatically adjust the resolver to the designated track angle to provide an indication thereof; alternatively, a digital display of the stored value may be used.

3,778,602

AREA NAVIGATION COMPUTER AND SOLID STATE FILTER

Jerry C. Schmitt, Overland Park, Kans., assignor to King Radio Corporation, Olathe, Kans.

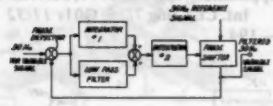
Filed Oct. 30, 1970, Ser. No. 85,644

Int. Cl. G06g *7/78*

U.S. Cl. 235—150.26 **15 Claims**

A solid state filter for area navigation computers and similar avionics equipment which rejects errors commonly resulting from VOR course scalloping and multipath effect on signal propagation between the ground station and an airborne receiving unit. The subject filter operates to sense the rate at which the ground station signal phase is changing and adds a compensating signal thereto in the receiving unit. As a result,

the ground station signal can be filtered with a long time constant to reject course scalloping and other errors while, at the



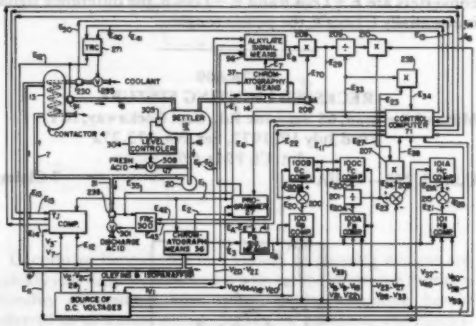
same time, compensating for the resulting aircraft position lag. The amount of course scalloping rejection can be increased until limited by the desire to maneuver the aircraft.

3,778,603

MEANS AND METHOD FOR ACHIEVING AN OPTIMUM OPERATING CONDITION FOR AN ALKYLATION UNIT

Donald E. Sweeney, Jr., Beaumont, Tex., assignor to Texaco Inc., New York, N.Y.

Filed May 26, 1972, Ser. No. 257,408
Int. Cl. G06f *15/46*; G06g *7/58*; G05b *13/02*
U.S. Cl. 235—151.12 **12 Claims**



A system controls the temperature at which olefins are contacted with an isoparaffin in the presence of acid in an alkylation unit, and the flow rate of acid entering or leaving the alkylation unit. The system senses conditions of a hydrocarbon product, which results when the acid is removed from a hydrocarbon-acid mixture after the contacting process, the contact temperature, a condition relating to the contact acid and the olefin composition. The system includes a source providing signals corresponding to the economic values related to the octane rating of alkylate, which is produced from the hydrocarbon product, to the acid consumption and to the cost of controlling the contact temperature. The system uses the signals corresponding to the sensed conditions and the economic value signals to develop control signals for apparatus that control the contact temperature and the acid flow rate.

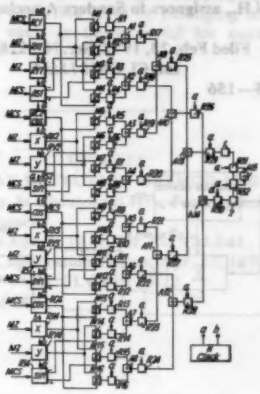
3,778,604

DIGITAL MEANS FOR COMPUTING FOURIER TRANSFORM OF A SERIES OF SAMPLES

Henri J. Bosc; Jean-Marie H. Colin, both of Paris, and Jean-Claude A. Debuisser, Fontenay-le-Fleury, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 29, 1971, Ser. No. 213,249
Claims priority, application France, Dec. 29, 1970, 7046963
Int. Cl. G06f *1/02*, *15/34*
U.S. Cl. 235—152 **3 Claims**

A digital computer device for computing an approximation of the Fourier transform of a sequence of m sample pairs having known times of occurrence. An equation expressing the transform is programmed into the computer device. Binary words representing multiplier coefficients are placed in a first cyclically read memory. The m sample pairs are coded into p-digit words in a second memory from which they are simultaneously available. At each first memory reading 2 m mul-



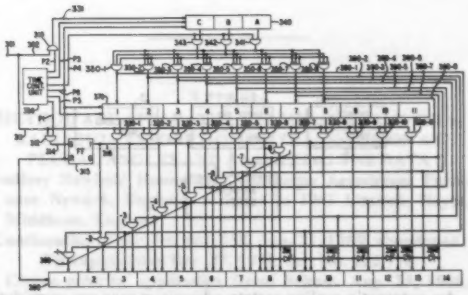
tiplier coefficients are applied at the same time as the 2 m sample binary words to 4 m multipliers. The p-digit multiplier outputs are applied to a plurality of binary adders to perform the algebraic additions required by the equation. The device is particularly adapted for computation of Fourier transform approximations in a received signal processing system for a coherent pulse Doppler radar.

3,778,605

DIGITAL EXPANDOR FOR PCM CODE WORDS

William Lloyd Montgomery, Little Silver, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Apr. 16, 1971, Ser. No. 134,704
Int. Cl. H04l *3/00*
U.S. Cl. 235—154 **13 Claims**



Compressed PCM digital code words having the serial form SABCWXYZ are expanded in accordance with a prescribed format. A control signal is generated in response to the binary number represented by the logical signals in the ABC bit positions. The control signal, in turn, is utilized to read the logical signals in the serial WXYZ bit positions directly into selected

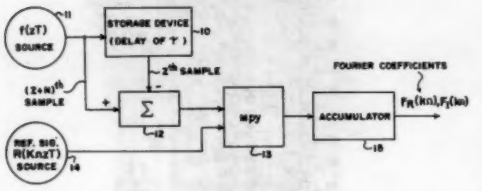
stages of a storage register and to supply a predetermined logical signal to other stages of the storage register, thereby completing the expanded digital code word in accordance with the expansion format.

3,778,606

CONTINUOUSLY UPDATING FOURIER COEFFICIENTS EVERY SAMPLING INTERVAL

Joseph W. Schmitt, Hudson, and Donald L. Starkey, Amherst, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Feb. 23, 1972, Ser. No. 228,545
Int. Cl. G06f *15/34*
U.S. Cl. 235—156 **4 Claims**



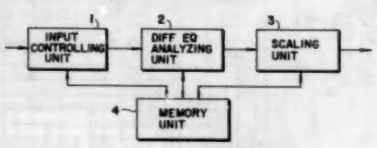
A method and apparatus for continually producing updated Fourier coefficient values of an input signal during each sample time. The Fourier coefficient $F(k\Omega)$ is first calculated for any sequence of N samples of the input signal $f(zT)$. To calculate the Fourier coefficients for the next ensuing sample time, the previously calculated Fourier coefficient value is updated by the addition of the product of the reference value and the difference between the new sample and the sample which occurred N samples earlier in time. This process is continued for each new sample.

3,778,607

AUTOMATIC SCALING SYSTEM

Shigeru Watanabe, Hachioji; Norio Yokozawa, Futyu; Shigeru Yabuuchi, Hachioji, and Ituko Terakado, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 23, 1972, Ser. No. 237,268
Claims priority, application Japan, June 25, 1971, 46/45676
Int. Cl. G06g *7/32*
U.S. Cl. 235—193 **10 Claims**



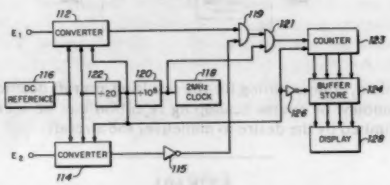
An automatic scaling system wherein means are provided which, in the case of programming of an analog operator, numerically analyzes an original differential equation in digital form for evaluating approximate solutions for the variables of the equation and for calculating the maximum values of the respective variables from the approximate solutions. Additionally, means are provided for determining voltage scale factors from the maximum values and thus, voltage and time scalings are automatically carried out.

3,778,608

ELECTRICAL MEASURING SYSTEMS USING A QUARTER-SQUARE MULTIPLIER

Peter L. Richman, 22 Barberry Rd., Lexington, Mass.

Division of Ser. No. 39,791, May 22, 1970, Pat. No. 3,633,116.
This application Aug. 30, 1971, Ser. No. 176,027
Int. Cl. G06g *7/16*; **G01r** *11/32*
U.S. Cl. 235—194 **10 Claims**



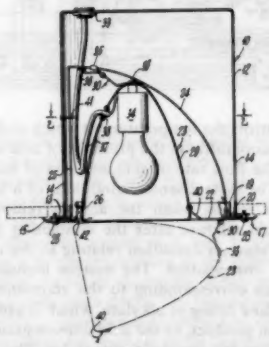
A system for measuring electrical power and including a pair of converters for providing a pair of output pulse trains, the duration of the pulse being proportional to the means squared value of input signals to the converters. A circuit is included for generating a signal proportional to the difference between corresponding pulses; where the input signals to the converters are $E + I \cos \theta$ and $E - I \cos \theta$, the difference signal is essentially $E I \cos \theta$, the power sought.

3,778,609

RECESSED LIGHTING FIXTURE

Milton Liberman, 65 Seawane Rd., East Rockaway, N.Y.

Filed July 19, 1972, Ser. No. 273,272
Int. Cl. F21s *1/02*
U.S. Cl. 240—73 HA **7 Claims**



A recessed lighting fixture having a reflector and lamp mounted in a housing having at least one opening therein. A curved track is mounted in the housing with the lamp assembly being slidably mounted on the track for movement between a first position in which the lamp assembly is substantially wholly contained substantially wholly within the housing and a second position in which the lamp assembly is positioned outside the housing.

3,778,610

ADJUSTABLE JOINT FOR ELECTRICAL FIXTURES

Leo Wolf, 5701 Sheridan Rd., Chicago, Ill.

Filed Dec. 4, 1972, Ser. No. 311,968
Int. Cl. F21v *21/00*
U.S. Cl. 240—73 BJ **6 Claims**

An adjustable joint for electrical fixtures and the like is constructed of two opposed hollowed housing members having

circular mating surfaces that are toothed. A spring internally joins the two housing members and urges them together in a yieldably lockable arrangement. The spring is disposed and ar-

ranged to avoid passing through or blocking a passage between the circular mating surfaces, and provides a pivot for adjustment. The toothed mating surfaces serve as both a bearing and a lock.

3,778,611

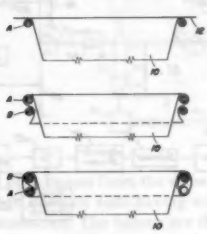
LAMPSHADE AND METHOD OF ASSEMBLY

Robert E. Burridge, Hillsdale, N.J., and Peter O. Everson, Darien, Conn., assignors to Craftings, Inc., Englewood, N.J.

Filed Apr. 19, 1972, Ser. No. 245,316

Int. Cl. F21v *1/06, 1/14*

U.S. Cl. 240—108 D **7 Claims**



Decorative lampshades in a variety of pleasing designs are quickly and simply constructed with a tube of stretch fabric, a plurality of resilient wire rings, and a technique herein referred to as a roll-finish lock. Simple mounting and electrical accessories adapt the shade so produced for use as a hanging ceiling fixture, a table lamp or a floor lamp.

3,778,612

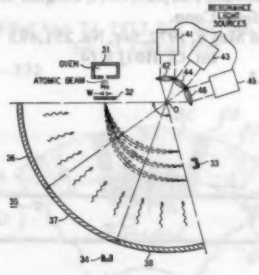
NEUTRAL PARTICLE BEAM SEPARATOR AND VELOCITY ANALYZER USING RADIATION PRESSURE

Arthur Ashkin, Allencrest Rd., Rumson, N.J.

Continuation-in-part of Ser. No. 885,070, Dec. 15, 1969, Pat. No. 3,710,279. This application Nov. 1, 1971, Ser. No. 194,733

Int. Cl. H01j *39/34*

U.S. Cl. 250—251 **6 Claims**



In the disclosed neutral-particle molecular-beam or atomic-beam separator, velocity analyzer or synchrotron, it is proposed to use the saturated value of radiation pressure on the particles, illustratively neutral particles, to deflect them in semicircular paths or in circular orbits. A light field at a resonance radiation frequency for the particles is created that converges radially in a horizontal plane throughout the desired portion or arc of a circle with intensity sufficient to exceed the saturated value and thus create a constant central force field. The field of use includes studying the interaction of atoms with high-intensity monochromatic light, and also includes separating, velocity analyzing or trapping neutral atoms having a specific hyperfine level or belonging to a specific isotopic species, such as those useful for nuclear power generation.

3,778,613

PIPE-LINE LEAK DETECTION METHOD AND DEVICE

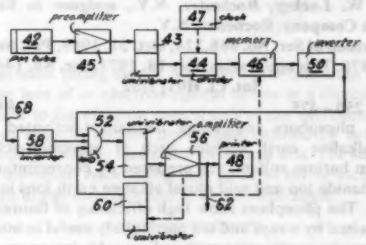
Gerard Dorgebray, la Chaussee-d Ivry, France, assignor to Elf Union, Paris, France

Filed Apr. 9, 1971, Ser. No. 132,641

Claims priority, application France, Apr. 17, 1970, 7014071

Int. Cl. G01n *23/12*

U.S. Cl. 250—43.5 MR **14 Claims**



For detecting and locating leaks in subterranean pipe lines which transport fluids, a radioactive tracer is circulated in the line, the line is flushed and a detection pig is moved along the line. A counting assembly in the pig monitors the radioactivity along the line and the distance from the starting point is printed each time the radioactivity exceeds a predetermined threshold.

3,778,614

METHOD AND APPARATUS FOR MEASURING X- OR γ-RADIATION ABSORPTION OR TRANSMISSION AT PLURAL ANGLES AND ANALYZING THE DATA

Godfrey Newbold Hounsfield, Winthorpe Aerodrome Farm, near Newark, England, assignor to EMI Limited, Hayes, Middlesex, England

Continuation of Ser. No. 861,538, Aug. 21, 1969, abandoned. This application Dec. 27, 1971, Ser. No. 212,778

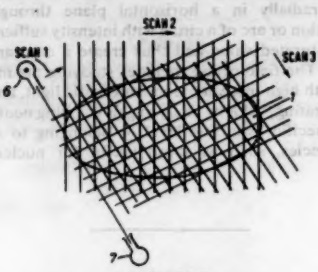
Claims priority, application Great Britain, Aug. 23, 1968, 40,317/68

Int. Cl. G01n *23/08*

U.S. Cl. 250—362 **28 Claims**

In apparatus for examining a body by means of X or Y radiation, a two-dimensional matrix of elements of the body is exposed to radiation from a number of directions and the transmission of the radiation by a plurality of paths of small cross-sectional area through the body is measured, the directions and numbers of the paths being such that each ele-

ment of the matrix is intersected by a group of paths which intersect different groups of elements. From these measure-



ments, the absorptions or transmissions in of the individual elements of the matrix are calculated and used to produce a cathode ray tube display and/or a photograph.

3,778,615

MIXED ALKALINE EARTH SULFATE PHOSPHOR FLUORESCENT SCREENS AND RADIOGRAPHIC ELEMENTS

George W. Luckey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 868,224, Oct. 21, 1969, Pat. No. 3,650,976. This application May 18, 1971, Ser. No. 144,673

Int. Cl. H01j *1/62*

U.S. Cl. 250—475 **4 Claims**

Novel phosphors comprising lanthanide-activated plural mixed alkaline earth sulfates such as europium-activated strontium barium sulfate, are prepared by coprecipitation of the lanthanide ion and said plural alkaline earth ions in dilute solution. The phosphors show high efficiency of fluorescence when excited by x-rays and are particularly useful in intensifying screens in combination with radiographic image recording elements.

3,778,616

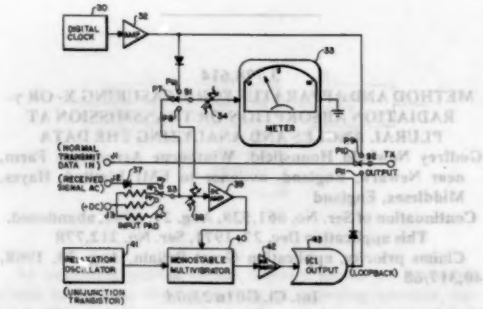
OPTICAL PATH ALIGNMENT INSTRUMENT

Don E. Ranniger, 2890 Robb Cir., Denver, Colo.

Filed May 30, 1972, Ser. No. 257,858

Int. Cl. H04b *9/00*

U.S. Cl. 250—199 **8 Claims**



A communications system operating in visible or infra red light bands, includes station 1 having a transmitter and station 2 having a receiver, and an alignment instrument utilizing clocked digital data is inserted in the transmitter of station 1 which may be utilized by station 2 to align its receiver to maximum signal. The received signal at station 2 may be fed into an alignment instrument utilizing a pulse generator, and the received signal is used to change the normal duty cycle of the pulse generator to 25 percent on and 75 percent off, and the output of the alignment instrument may be connected to the output of station 2 in loopback. The received signal voltage at station 2 will increase the duty cycle above the 25 percent proportional to the level of the received signal voltage. By transmitting this back to the station 1, its received signal can be increased or decreased by vertical and/or horizontal adjustment of station 1 transmitter.

3,778,617

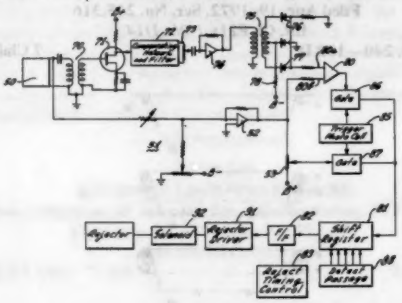
CONTAINER INSPECTION APPARATUS

Frederick L. Calhoun, Torrance, Calif., assignor to A-T-O Inc., Cleveland, Ohio

Division of Ser. No. 660,978, Aug. 16, 1967, Pat. No. 3,529,167. This application Feb. 12, 1970, Ser. No. 10,884

Int. Cl. H01j *39/12*

U.S. Cl. 250—223 B **4 Claims**



A container inspection device is disclosed wherein the bottom of a bottle is observed by an exchangeable lens system with a nutating, instantaneous object field of view. A reticle with opaque and transparent area of greatly differing size modulates the light from the object field and the modulated light is detected by a solar cell. The solar cell is a-c coupled to a detector circuit responding to a-c signals within a particular frequency range when exceeding a threshold. The threshold level is controlled through a circuit which is d-c coupled to the solar cell. Signals exceeding the threshold control separation of the bottle from others.

3,778,618

PHOTODETECTION OF NON-OPAQUE OBJECTS TRANSPORTED ALONG A CONVEYOR BY USE OF A LIGHT BLOCKING OPAQUE FLAP

Kenneth W. Laskowski, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 8, 1972, Ser. No. 251,493

Int. Cl. H01j *3/14*

U.S. Cl. 250—223 **3 Claims**

Photodetection of the passage of transparent or translucent sheets along a conveyor is effected by placing an opaque flexi-

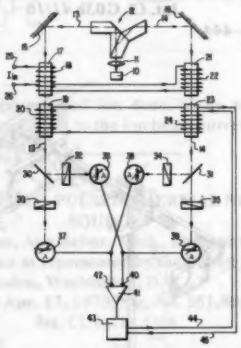
ble flap in the path of movement of the sheets on the conveyor. The flap is engaged and moved forward by the sheets a short distance along the conveyor, into the photodetector light path.

3,778,619

INPUT CONNECTIONS FOR DIFFERENTIAL AMPLIFIERS

Alain Carnel, Paris, France, assignor to Compteurs Schlumberger, Montrouge, France

Filed Mar. 22, 1972, Ser. No. 236,926
Claims priority, application France, Jan. 28, 1971, 7109978
Int. Cl. G02f *1/18*
U.S. Cl. 250—225 **4 Claims**



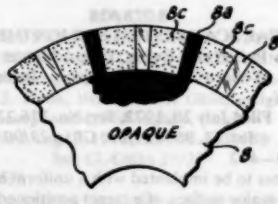
Two polarized light beams from the same source are rotated by passage through Faraday rods having windings supplied by a current to be measured. The beams are then counterrotated by passage through second Faraday rods having windings supplied by a compensating current. Each beam is then applied to a beam splitting semi-reflective mirror which displaces it into distinguishable components. Optical analyzers then attenuate each beam in accordance with a function of the angular displacement from reference or preferential polarization planes. Pairs of photoresponsive detectors transduce the resulting beams into pairs of electrical signals, each pair having a signal of different sign or sense. Signals of like sign are then combined and the two resulting signals are applied to the two inputs of a differential amplifier. The amplifier output is used to develop a proportional compensation signal for the second Faraday rods and can be displayed as a measure of input current.

3,778,620

SQUARE WAVE ROTARY PULSE TRANSDUCER

Robert W. Lindemann, and John W. Parmley, both of Watertown, Wis., assignors to Cutler-Hammer Inc., Milwaukee, Wis.

Filed Apr. 24, 1972, Ser. No. 246,803
Int. Cl. G01d *5/36*
U.S. Cl. 250—232 **8 Claims**



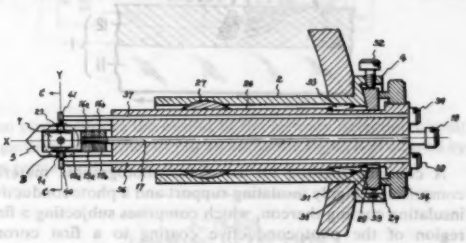
An electro-optical pulse generator. A disc having alternate transparent and opaque areas at its periphery is rotated between a light emitting diode (LED) and a photo-transistor to generate pulses. In order to avoid generation of spurious pulses in the event of slight rotation due to vibration or the like causing shifting across the opaque-to-transparent tripping point, gray (semi-transparent) areas are interposed on this disc between the transparent and opaque areas. These gray areas will not cause tripping and, thus, lengthen the angular distance between the high (transparent) tripping point and the low (opaque) tripping point to prevent unwanted pulses.

3,778,621

SPECIMEN TILTING DEVICE FOR AN ELECTRON OPTICAL DEVICE

Akio Mikajiri, Tokyo, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed June 13, 1972, Ser. No. 262,208
Int. Cl. H01j *37/26*; **G01n** *23/02*
U.S. Cl. 250—442 **4 Claims**



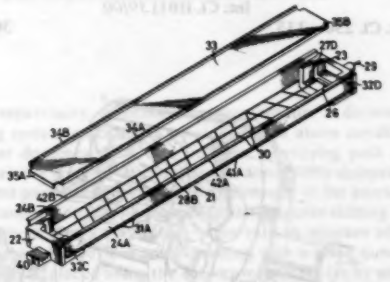
A specimen tilting device for inserting a specimen into the objective lens of an electron optical device in a direction perpendicular to the electron optical axis of the microscope. The specimen stage is located on a plane defined by two tilting axes perpendicular to said electron optical axis. The stage may be rotated about each tilting axis so as to tilt or incline said specimen in any direction and at any desired angle.

3,778,622

CHARGING APPARATUS FOR ELECTRO-PHOTOGRAPHIC COPYING MACHINES

Akira Kobayashi; Tadashi Sugano; Toshio Koike, and Minehiro Sakata, all of Tokyo, Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Sept. 30, 1970, Ser. No. 76,886
Int. Cl. G03g *15/00*
U.S. Cl. 250—324 **12 Claims**



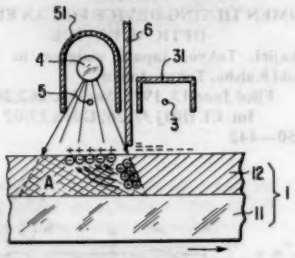
A charging apparatus for electrostatically charging copying material in an electro-photographic copying machine includes a receptacle with its bottom plate fitted detachably and held in place by a spring. This receptacle holds a tungsten wire to produce a corona discharge and the wire can be easily replaced by removing the bottom plate.

3,778,623

CHARGING METHOD OF ELECTROPHOTOGRAPHIC MATERIALS

Masamichi Sato; Masaaki Takimoto; Isoji Takahashi, and Takao Komaki, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 18, 1972, Ser. No. 281,927
Claims priority, application Japan, Aug. 20, 1971, 46/63430
Int. Cl. G03g *13/02*
U.S. Cl. 250—325 3 Claims



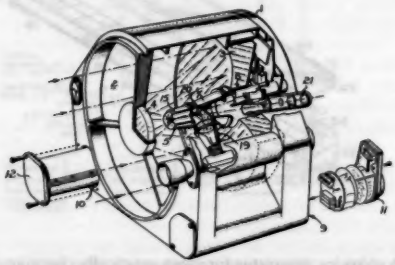
A charging method for an electrophotographic material comprising a highly insulating support and a photoconductive insulating coating thereon, which comprises subjecting a first region of the photoconductive coating to a first corona discharge of one polarity while simultaneously irradiating with light, whereby said irradiation is absorbed by said photoconductive coating, and at the same time subjecting a second region of said photoconductive coating which is continuous to and radiation insulated from said first region, to a second corona discharge of the opposite polarity and causing a relative movement between said electrophotographic material and the corona discharge devices in such a manner that said electrophotographic material is subjected to said first corona with light irradiation and then is subjected to said second corona successively, is disclosed.

3,778,624

THERMAL IMAGING DEVICE

Neal K. Jones, Brighton, South Australia; Douglas W. Faulkner, Salisbury Heights, South Australia; Robert T. Johnston, North Walkerville, South Australia, and Murray R. Meharry, Elizabeth Park, South Australia, all of Australia, assignors to The Commonwealth of Australia, Melbourne, Victoria, Australia

Filed May 1, 1967, Ser. No. 637,036
Int. Cl. H01j *39/00*
U.S. Cl. 250—333 30 Claims



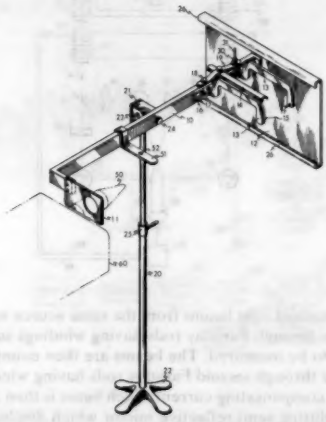
A thermal imaging device comprising collector means to focus infra-red rays, a fluorescent screen enclosed in a sealed evacuated capsule and including a phosphor on a membrane, said fluorescent screen being positioned at the focal plane of the collector means, an energizing source for the fluorescent screen and means for varying the fluorescence which results from the presence of an infra-red image on the screen.

3,778,625

CEPHALOMETRIC DEVICE

Robert Schwartz, 1271 Westfield Ave., Rahway, N.J., and Morris Goldberg, 14 Vonderventer Ave., Port Washington, N.Y.

Continuation of Ser. No. 108,325, Jan. 21, 1971, abandoned.
This application July 17, 1972, Ser. No. 272,295
Int. Cl. G03b *41/16*
U.S. Cl. 250—444 8 Claims



A cephalometric device useful in the preparation of substantially duplicatable skull X-rays is comprised of an elongated boom member having an inner and outer end, a cone holding member connected to the inner end of the boom member, a film cassette holder connected to the outer end of the boom member, a head locator system and an orbital pointer positioned on the boom immediately adjacent to the film cassette holder, and a stand member adapted to position the boom member in a substantially horizontal position. The cephalometric device is adapted to be employed in conjunction with a standard X-ray machine. The combination of cephalometric device and X-ray machine is used to produce lateral view X-ray plates or pictures of the head that are duplicatable within reasonable accuracy.

3,778,626

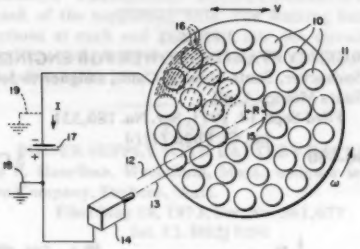
MECHANICAL SCAN SYSTEM FOR ION IMPLANTATION

Gordon Ian Robertson, Ewing Twsp., Mercer City, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed July 28, 1972, Ser. No. 276,230
Int. Cl. B05c *11/00*; G01n *23/00*
U.S. Cl. 250—492 22 Claims

Workpieces to be implanted with a uniform ion dose are attached to a major surface of a target positioned in the path of an ion beam. The target is rotated and traversed so that the ion beam traces segments of spiral paths on each workpiece. The

uniformity of the ion dose in the workpieces is controlled by regulating the position of the target during each traversal according to the accumulated ion dose, or by regulating the traversing speed according to the ion beam current.

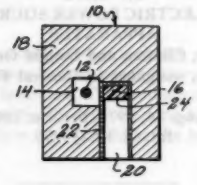


3,778,627

HIGH INTENSITY, PULSED THERMAL NEUTRON SOURCE

John M. Carpenter, Ann Arbor, Mich., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Apr. 17, 1973, Ser. No. 351,893
Int. Cl. G21g 3/04
U.S. Cl. 250—499 14 Claims



This invention relates to a high intensity, pulsed thermal neutron source comprising a neutron-producing source which emits pulses of fast neutrons, a moderator block adjacent to the fast neutron source, a reflector block which encases the fast neutron source and the moderator block and has a thermal neutron exit port extending therethrough from the moderator block, and a neutron energy-dependent decoupling reflector liner covering the interior surfaces of the thermal neutron exit port and surrounding all surfaces of the moderator block except the surface viewed by the thermal neutron exit port.

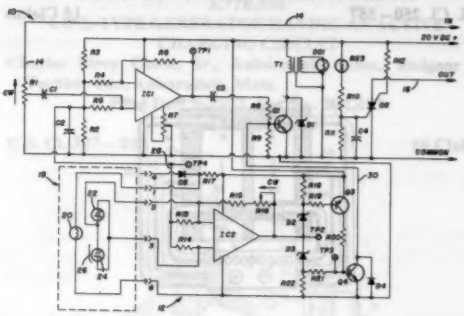
3,778,628

SECONDARY DETECTION CIRCUIT WITH SHARP CUTOFF FOR SECURITY VALIDATING

Frank A. Novak, Seven Hills; Kenneth T. Schreiber, Bedford, and Steven J. Hydo, Berea, all of Ohio, assignors to ARDAC/USA Incorporated, Willoughby, Ohio

Filed Aug. 2, 1971, Ser. No. 168,088
Int. Cl. G01n 21/32
U.S. Cl. 250—556 11 Claims

A secondary detection circuit for a paper security validating device which device scanned a portion of one surface of the paper security. The secondary detection circuit compares the level of reflection of light from the reverse side of the security with a known level and, if the reflected level falls below a first value or exceeds a second greater value, the secondary detection circuit blocks the output of the primary detection circuit regardless of whether or not an authentic signal is produced by the primary circuit.

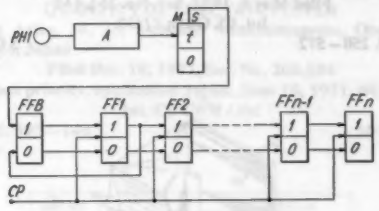


3,778,629

JAMMING DETECTION

Raymond M. F. Terryn, Borgerhout, Belgium, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 25, 1972, Ser. No. 229,373
Claims priority, application Netherlands, Mar. 17, 1971, 7103555
Int. Cl. B65h 7/00; G01n 21/30; G08b 21/00
U.S. Cl. 250—557 6 Claims



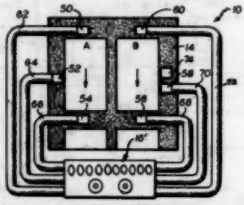
This supervisory detection arrangement for a document handling system particularly provides for an alarm condition whenever documents are lost from the conveying path and when they are jammed up or otherwise abnormally delayed. A document passing in front of a first photocell at the entrance of a document conveyor path starts a shift register shifting a 1-state through it at a main clock pulse rate. A number of registering bistable devices corresponding with a same number of photocells, placed along the conveyor path are set by an intermediate clock pulse phase-shifted with respect to the main clock pulse when a corresponding shift register stage is set. Each registering bistable device is reset by a document passing in front of a corresponding photocell and its condition is tested when the same or one of the following shift register bistable devices is in the 1-state and at the occurrence of a second intermediate clock pulse. Alarm conditions are thus detected when the registering bistable has not been reset.

3,778,630

MICROFILM SEARCHING SYSTEM

Eugene T. White, 40 New Mill Rd., and Joseph H. McEnroy, 10 Sandpiper Ct., both of Smithtown, N.Y.

Filed Sept. 28, 1971, Ser. No. 184,513
Int. Cl. G01n 21/30; G03b 23/12; G06f 7/38
U.S. Cl. 250—557 15 Claims



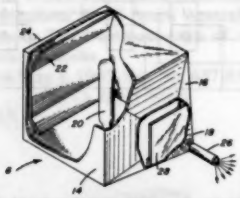
In an automatic microfilm searching system wherein a plurality of spaced images recorded on a film are displayed on the screen of a film reader at least one at a time, an apparatus and method for locating a particular one of the images for display by sensing the images displayed in accordance with at least one of a plurality of available distinct sensing formats and then counting the number of images so sensed. Each sensing format is defined by a distinct set of indicia on the film which are sensed and counted. The indicia of at least one available sensing format includes the images themselves, such as a preselected edge of each image.

3,778,631

METHOD AND APPARATUS FOR OPTICALLY DETECTING DEFECTS IN SPECULAR WEBS

Hubert B. Allinger, and Harry L. Edwards, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 8, 1972, Ser. No. 251,442
Int. Cl. G01n 21/30
U.S. Cl. 250—572 3 Claims



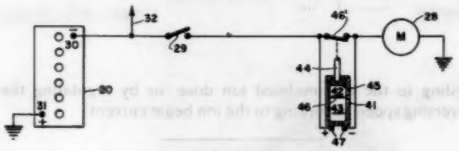
Webs of reflecting material are inspected for defects by directing upon the web surface a beam of light having a radiating pattern substantially of the type produced by an ideal point light source. The rays, which spread outwardly from the light source, are redirected by the reflecting web to continue on to a receiving device for monitoring. Light reflected from a defect-free portion of the web presents at the receiving device a uniform pattern having no abrupt changes in intensity, while rays reflected from a defect deviate from the said uniform pattern, the nature of the deviation being related to the type of defect. Because of the spreading characteristic of the rays, the pattern deviations enlarge as the rays travel to the receiving device, and consequently they present a readily detectable defect indication even when produced by small defects. Hence, enlarged indication of defects is achieved without requiring lenses, thereby avoiding the depth of field, alignment, and dust accumulation considerations which lenses present. The receiving devices may rely on visual monitoring or monitoring achieved through sensing devices.

3,778,632

EMERGENCY STARTING POWER FOR ENGINES

Robert I. Sarbacher, Santa Monica, Calif., assignor to John C. Bogne, Santa Monica, Calif.

Filed Sept. 14, 1971, Ser. No. 180,331
Int. Cl. F02n 11/14
U.S. Cl. 290—50 5 Claims



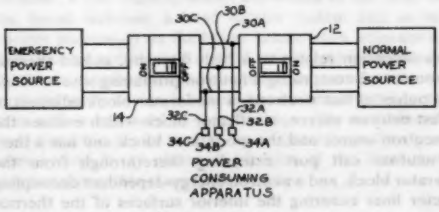
An emergency power system is designed to provide additional battery power for starting engines operating on petroleum products, when the normal battery supply for this purpose has insufficient energy available. The system utilizes either primary reserve cells or dry charged secondary cells for the supplemental power and connects them in such a manner that they can be activated immediately when required.

3,778,633

AUTOMATIC ELECTRIC POWER SOURCE TRANSFER APPARATUS

Christian DeVisser, Clinton, and Donald Orville Myers, Normal, both of Ill., assignors to General Electric Company, New York, N.Y.

Filed Aug. 14, 1972, Ser. No. 280,108
Int. Cl. H02j 9/00
U.S. Cl. 307—64 10 Claims



A pair of over-center spring mechanism type molded case electric circuit breakers are disposed in end-to-end spaced alignment. The circuit breakers are each multi-pole circuit breakers and each includes a single operating handle of the reciprocating toggle type. The handle of each of the breakers must travel a greater portion of the possible full length of travel in going from OFF toward ON position in order to operate the contacts than the same handle has to when moving from ON toward OFF position in order to operate the contacts. As a result, when both handles are operated simultaneously by a slide member, the circuit breaker which was in ON condition at the beginning of travel is moved to OFF condition before the circuit breaker which was in OFF condition at the beginning of travel moves far enough to actuate its mechanism to ON condition. Accordingly, the initially closed circuit

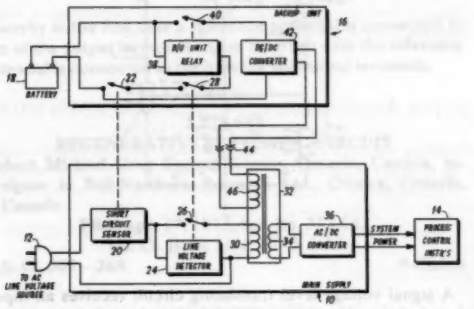
breaker is opened before the initially open circuit breaker is closed, thereby avoiding any possibility of an overlap condition in which both circuit breakers may be closed at the same time, which might short circuit the power sources. As a further precaution, a "walking beam" interlock member is included at the back of the supporting base. The walking beam carries projections at each end extending into the circuit breakers respectively and positively preventing the closing of both circuit breakers at the same time.

3,778,634

POWER SUPPLY WITH BATTERY BACKUP

James P. Hanrihan, Wrentham, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed May 18, 1973, Ser. No. 361,677
Int. Cl. H02j 9/00
U.S. Cl. 307—64 **8 Claims**



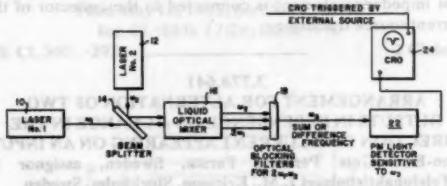
A power supply configuration is shown which provides for the addition of battery backup capabilities without unnecessary conversions or hardware. This configuration includes logic circuitry for automatically activating the backup unit in case of line voltage failure while disabling the backup unit in case of a short circuit.

3,778,635

LIQUID PARAMETRIC OPTICAL MIXING DEVICE

John F. Giuliani, Kensington, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 8, 1972, Ser. No. 260,863
Int. Cl. H03f 7/00
U.S. Cl. 307—88.3 **8 Claims**



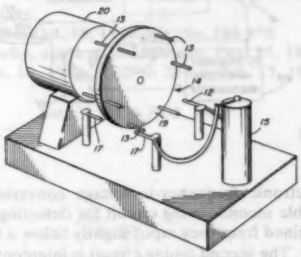
A laser-light mixing device in which the nonlinear medium for mixing two collinear laser beams comprises the chemical compound hexafluoroisopropanol, $(CF_3)_2CHOH$, which has an index of refraction which varies by only one part per thousand over a spectral range of 6,300 to 7,700 A, thus enabling mixing to occur over a long pathlength. The light resulting from the mixing action is then passed through an optical filter which allows only the sum or difference frequency to pass.

3,778,636

LINE-TYPE GENERATOR HAVING AN ACTIVE CHARGING CIRCUIT

Charles Elroy Chase, Sr., Auburndale, Mass., assignor to Tachisto Inc., Auburndale, Mass.

Filed Dec. 3, 1971, Ser. No. 204,497
Int. Cl. H03k 3/64
U.S. Cl. 307—108 **10 Claims**



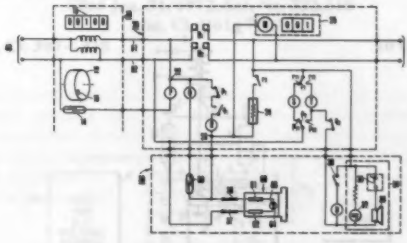
A line-type pulse generator having an active charging circuit to provide intermittent charging during the interpulse period, capable of infinite variations in pulse rate, an unexpectedly high charging efficiency, sequential charging of multiple energy-storage elements and subsequent discharge into independent loads, and complete elimination of misfiring. The switch of the active charging circuit may be provided by a dual rotary spark gap including, in particular, elements in common with the switch of the discharging circuit. Two rotary-spark-gap pulsers are described in detail.

3,778,637

APPARATUS FOR SUPPLYING A PREDETERMINED QUANTITY OF ELECTRIC POWER

Koshei Arita, 10, 23, 2-chome, Minamimagome, Ohota-ku, Tokyo, Japan

Filed Dec. 10, 1971, Ser. No. 206,684
Claims priority, application Japan, June 18, 1971, 46/43352
Int. Cl. G07f 1/06
U.S. Cl. 307—140 **10 Claims**

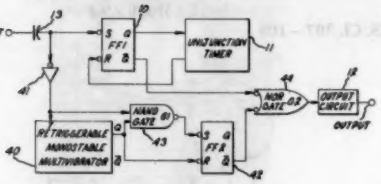


Apparatus for supplying a predetermined measured quantity of electric power. Specially designed chit in form of a chip inserted in a receptacle operates a switch in main power line to supply predetermined measured quantity of power whereupon apparatus automatically opens switch if apparatus has not been reactivated by insertion of another chip. An alarm system is activated in advance of measured amount of power being used to warn consumer that service will be discontinued if apparatus is not reactivated by insertion of another chip.

3,778,638
FREQUENCY-TO-VOLTAGE CONVERTER HAVING HIGH NOISE IMMUNITY

Philip M. Garratt, Amsterdam, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 9, 1972, Ser. No. 304,994
Int. Cl. H03d *13/00*; **H03k** *5/20*
U.S. Cl. 307—233 **18 Claims**

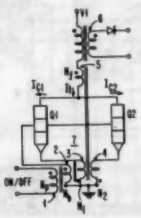


An electronic frequency-to-voltage converter employs a retriggerable second timing circuit for detecting a monitored predetermined frequency input slightly below a specific rated frequency. The second timing circuit is interconnected with a main timing circuit through digital logic circuitry and overrides the main timer when the input exceeds the predetermined frequency and also causes the converter output voltage to abruptly rise to, and remain at, a voltage amplitude corresponding to the rated frequency input. Noise interference is eliminated by interconnecting a binary counter in the circuit for counting up to a predetermined number of input pulses which may include noise, during the timing cycle of the second timing circuit. The overriding function of the second timing circuit is thereby delayed until the predetermined number of pulses have occurred during the timing cycle of the second timing circuit.

3,778,639
TRANSISTOR SWITCH USING A CURRENT SHARING PULSE TRANSFORMER

Hobart Atsushi Higuchi, and Lawrence Paul Trubell, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 12, 1972, Ser. No. 252,766
Int. Cl. H03k *17/60*, *17/06*
U.S. Cl. 307—254 **11 Claims**

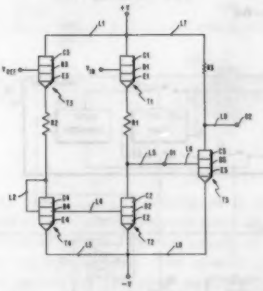


The invention relates to a transistor switch circuit which employs the use of a current sharing pulse transformer. The current sharing pulse transformer has a secondary winding in the emitter circuit of each of the two transistors used within the circuit. Another secondary winding is connected to the bases of the two transistors used. Finally, another secondary winding is connected in the collector circuit of the transistor switch to provide a feedback signal. The current sharing pulse transformer is used to control the turn-on and turn-off of the transistor switch circuit. More specifically, the secondary windings in the emitter circuit controls the turn-off characteristic associated with the two transistors such that they will turn off at the same time.

3,778,640
SIGNAL VOLTAGE LEVEL TRANSLATING CIRCUIT

Steven Platt, Underhill, Vt.; Jehoshua N. Pomeranz, Suffern, N.Y., and Dinesh K. Tewarson, Essex Junction, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 3, 1972, Ser. No. 268,315
Int. Cl. H03k *17/00*
U.S. Cl. 307—254 **9 Claims**



A signal voltage level translating circuit receives an input electrical signal having predetermined voltage swings about a first predetermined voltage level and translates the voltage level of the signal so that at the output there is provided an output electrical signal having the same voltage swings about a second predetermined voltage level translated with respect to the first voltage level. An input transistor has its base connected to the input node and its emitter connected to one end of a first impedance element having its other end connected to the collector of a current source transistor. A fixed reference voltage is applied to the base of a reference voltage transistor having its emitter connected to one end of a second impedance element having an impedance equal to that of the first impedance element. The other end of the second impedance element is connected to the collector of a diode-connected transistor having its base connected to the base of the current source transistor. The emitter of the diode-connected transistor is connected to the emitter of the current source transistor. If implemented in the form of a monolithic integrated circuit, the diode-connected transistor and current source transistor may have the same base and the same emitter. The translated signal is taken at the output where the first impedance element is connected to the collector of the current source transistor.

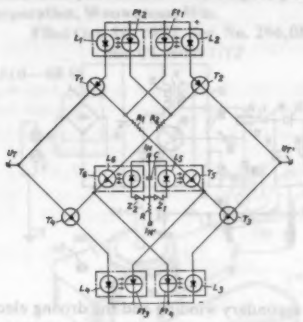
3,778,641
ARRANGEMENT FOR ALTERNATION OF TWO OUTPUTS IN DEPENDENCE ON A CHANGE IN THE DIRECTION OF A CURRENT APPEARING ON AN INPUT

Sven-Eric Gote Persson, Farsta, Sweden, assignor to Telefonaktiebolaget L.M., Ericsson, Stockholm, Sweden

Filed Jan. 20, 1972, Ser. No. 219,389
Claims priority, application Sweden, Jan. 29, 1971, 1056/71
Int. Cl. H03k *17/30*, *17/78*
U.S. Cl. 307—255 **5 Claims**

The arrangement in accordance with the present invention carries out an alternation of the polarities of two output terminals upon a change in the direction of an input current such that the polarities of the output terminals always represent the actual direction of the input current. For one direction of the

current one transistor in each of two pairs of transistors is made conducting and for the other direction of said current, the other transistor in each of said pairs is made conducting,



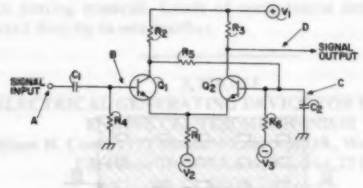
whereby in the first case a reference potential is connected to one of the output terminals and in the other case the reference potential is connected to the other of the output terminals.

3,778,642

REGENERATIVE SWITCHING CIRCUIT

Robert Michael Gray Frame, Kanata, Ontario, Canada, assignor to Bell-Northern Research Ltd., Ottawa, Ontario, Canada

Filed Apr. 17, 1973, Ser. No. 352,042
Int. Cl. H03k *5/01*; **H04b** *3/58*
U.S. Cl. 307—268 **4 Claims**



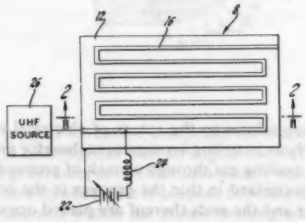
A switching circuit for regenerating pulses in the repeater of a digital transmission system which utilizes an R-C compensating network to minimize base line wander resulting from low frequency cut-off in the input coupling network.

3,778,643

A SOLID STATE VARIABLE DELAY LINE USING REVERSED BIASED PN JUNCTIONS

James M. Jaffe, Southfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 18, 1972, Ser. No. 254,613
Int. Cl. H03k *17/26*; **H03h** *7/30*
U.S. Cl. 307—293 **2 Claims**



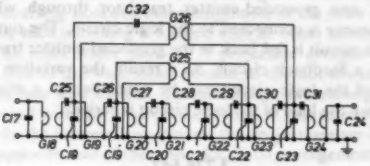
An electronically variable delay line including a wafer of silicon on one side of which a thin insulating layer is deposited. A highly conducting ground plane contacts the silicon wafer on its remaining side while a highly conducting microstrip line contacts the insulating layer. The microstrip line contacts the silicon wafer through small holes etched in the insulating layer at predetermined intervals. At these holes, P-N junctions are formed. The P-N junctions are reverse biased so as to vary the effective thickness of the insulating layer to vary the delay time by creating a depletion layer within the silicon wafer which acts as an effective insulator.

3,778,644

FILTER CIRCUIT

Bernd Kohlhammer, Markbronn, Germany, assignor to LICENTIA Patent-Verwaltungs GmbH, Frankfurt am Main, Germany

Filed Oct. 18, 1971, Ser. No. 189,975
Claims priority, application Germany, Oct. 17, 1970, P 20 51 061.6; Nov. 16, 1970, P 20 56 204.3; Feb. 17, 1971, P 21 07 523.0
Int. Cl. H03h *7/02, 7/44*
U.S. Cl. 307—295 **19 Claims**



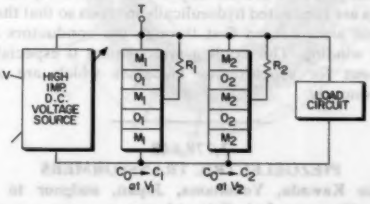
A filter circuit formed with a plurality of gyrators and a plurality of impedances. Each of the gyrators has a pair of input terminals and a pair of output terminals. At least one of the gyrators is a bridging gyrator which bridges an odd number of the remaining gyrators . One input terminal and one output terminal of each gyrator are connected to a point of reference potential.

3,778,645

SOLID-STATE SWITCHING CAPACITOR

Robert J. Mattauch, and Thomas J. Viola, Jr., both of Charlottesville, Va., assignors to The Rector and Visitors of the University of Virginia, Charlottesville, Va.

Filed Jan. 31, 1972, Ser. No. 222,210
Int. Cl. H01g *7/00*
U.S. Cl. 307—318 **10 Claims**



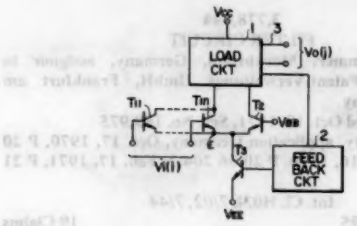
A capacitor structure comprising a first thin film tunneling capacitor in circuit with a resistor and a second capacitor wherein the capacitance value of said structure switches abruptly with applied bias potential.

3,778,646

SEMICONDUCTOR LOGIC CIRCUIT

Akira Masaki, Kanagawa-ken, Sagamihara-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 31, 1972, Ser. No. 222,247
Claims priority, application Japan, Feb. 5, 1971, 46/4229
Int. Cl. H03k 19/34, 5/08, 1/14
U.S. Cl. 307—215 14 Claims



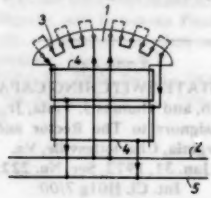
A current mode type semiconductor logic circuit comprises at least one grounded-emitter transistor through which a power source is connected to the logic circuit. The output of the logic circuit is fed back to the grounded-emitter transistor through a feedback circuit. As a result, the variation in the output of the logic circuit can be controlled to a minimum even when the load of the logic circuit is varied.

3,778,647

ELECTRIC SALIENT-POLE MACHINE

Werner Leistner, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed July 14, 1972, Ser. No. 272,080
Claims priority, application Germany, Sept. 24, 1971, P 21 48 439.9
Int. Cl. H02k 9/00
U.S. Cl. 310—54 10 Claims



An electric salient-pole machine has excitation and damping windings which are directly cooled with a liquid. These windings are connected hydraulically in series so that the cooling liquid always flows first through the conductors of the damper winding. This cooling arrangement is especially advantageous for synchronous machines which are started asynchronously.

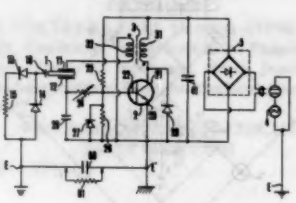
3,778,648

PIEZOELECTRIC TRANSFORMERS

Takehiko Kawada, Yokohama, Japan, assignor to Denki Onkyo Company, Ltd., Tokyo, Japan

Filed June 28, 1972, Ser. No. 267,250
Claims priority, application Japan, July 5, 1971, 46/49448
Int. Cl. H01v 7/00
U.S. Cl. 310—8.1 7 Claims

In a driving circuit for driving a piezoelectric transformer including a piezoelectric member provided with a pair of driving electrodes and an output electrode, there are provided a transformer having primary and secondary windings and a transistor. The collector electrode of the transistor is connected to one pole of a DC source through the primary winding, and the secondary winding and the driving electrodes are connected in series across the base and emitter electrodes thereby forming an oscillation circuit for producing a high frequency driving voltage.

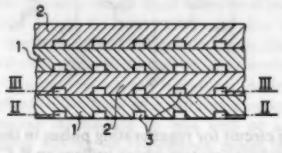


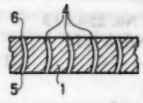
3,778,649

ROTOR WINDING FOR ELECTRICAL MACHINES WITH GROOVED CONDUCTORS

Christian Lehuen, Cravanche, and Roger Gillet, Belfort, both of France, assignors to Societe Generale De Constructions Electriques Et Mecaniques (Alsthom), Paris, France

Filed July 10, 1972, Ser. No. 270,033
Claims priority, application France, July 8, 1971, 7125140
Int. Cl. H02k 1/32
U.S. Cl. 310—61 7 Claims





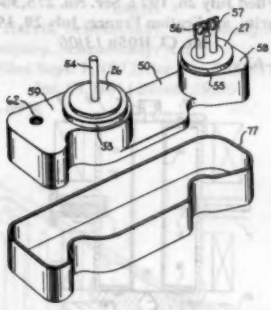
The invention relates to the rotors of electrical machines, and particularly to a cooling arrangement therefor providing a circulation of cooling gas through a stack of grooved conductors. It is characterized in that the grooves in the conductors are curvilinear and the ends thereof are placed opposite each other. The invention is applicable notably to conductors disposed in rotor slots, which eliminates any risk of shearing of the conductors.

3,778,650

BATTERY CHARGING REGULATOR-RECTIFIER MODULE

Paul A. Tharman, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Oct. 10, 1972, Ser. No. 296,084
Int. Cl. H01l *1/12*
U.S. Cl. 310—68 D 3 Claims



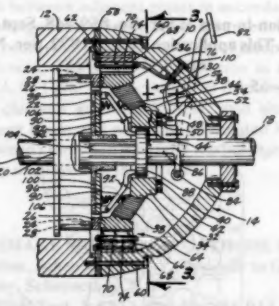
A power diode and an SCR are secured in snug bores in a metal holder that serves as heat sink and electrical connector. One terminal element of a plug connector is crimped directly to the anode terminal of the diode, thus enabling the whole plug to be fixed relative to the holder before the holder with attached compoents is inserted into a container that is filled with potting material. Leads of components are crimp connected directly to one another.

3,778,651

ELECTRICAL GENERATING DEVICE FOR USE WITH ENGINE CLUTCH MECHANISM

William H. Cone, 1151 Meadow Lane Apt. 3A, Waterloo, Iowa

Filed June 19, 1972, Ser. No. 264,271
Int. Cl. H02k *7/02*
U.S. Cl. 310—74 5 Claims



The present invention comprises an electrical generating device in combination with an engine clutch mechanism. The current generating device includes a rotor which is rigidly connected to a flywheel and is adapted to rotate therewith. A stator is mounted within the clutch housing and surrounds the rotor so that rotation of the rotor causes electrical current to be generated in the stator windings. Also mounted within the clutch housing is a clutch mechanism.

3,778,652

ROTOR STRUCTURE WITH SQUIRREL CAGE WINDING

James W. Endress, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 8, 1972, Ser. No. 278,847
Int. Cl. H02k *3/06*
U.S. Cl. 310—211 2 Claims

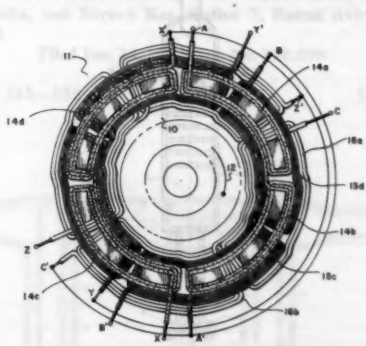
The laminae or punchings forming the rotor core are arranged in groups in stack formation. All the punchings are of identical shape and are formed with radially disposed slots which are, in the assembled rotor, aligned to form conductor bar receiving slots extending lengthwise of the rotor core. The slot in each punching is formed with an outer narrow portion and an inner wider portion. A projection extends from one side wall of the wide inner portion of the slot toward the opposite side wall thereof. The punchings in certain groups are arranged with the projections therein at one side of the rotor slot. In the intermediate groups, the projections are located at the opposite side of the rotor slot. Such arrangement provides a tortuous passage for reception of cast conductor bars, the projections serving to limit shrinkage of the bar metal in directions lengthwise of the rotor slot and also radially.

3,778,653

ALTERNATING CURRENT MACHINE ARMATURE

Harold C. Scott, 2114 Marvel, Irving, Tex.

Filed Feb. 24, 1972, Ser. No. 228,896
Int. Cl. H02k *13/02*
U.S. Cl. 310—144 6 Claims



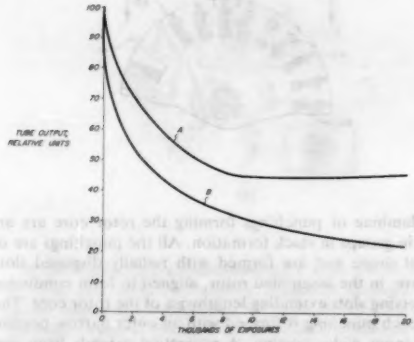
Disclosed is an improved armature construction for an alternating current generator wherein a plurality of separate sets of armature windings disposed within a magnetic flux field have their respective outputs coupled to respective output terminals which are coupled by unidirectional current means to produce a plurality of output currents which are defined multiples of one another.

3,778,654

MOLYBDENUM ALLOY TARGET FOR MAMMOGRAPHIC USAGE IN X-RAY TUBES

Robert E. Hueschen, Hales Corners, and Frank Bernstein, Milwaukee, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 2, 1972, Ser. No. 303,015
Int. Cl. H01j *35/10*
U.S. Cl. 313—60 9 Claims



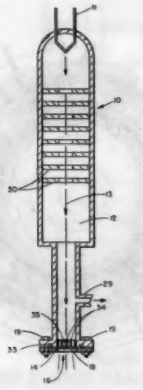
Low temperature ductility and high temperature strength of a molybdenum target for X-ray tubes employed in mammographic applications is achieved by alloying molybdenum with tungsten. The alloy target provides the necessary characteristic radiation of molybdenum while maintaining exceptional resistance to surface fracture and radiation output degradation under the required exposure condition for mammography.

3,778,655

HIGH VELOCITY ATOMIC PARTICLE BEAM EXIT WINDOW

George A. Luce, 1512 Villanova Dr., Austin, Tex.

Filed May 5, 1971, Ser. No. 140,499
Int. Cl. H05h *7/00*
U.S. Cl. 313—63 4 Claims



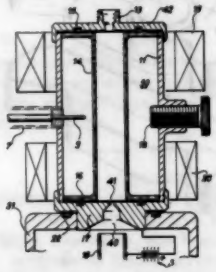
A composite metal foil exit window for use in an atomic particle accelerator. The exit window is formed from cohesively joined, bonded, or chemically attached layers of a metal having a low energy loss or stopping power for atomic particles, and an unreactive material. An exit window so constructed has improved chemical stability in a hostile environment and yet allows passage of a great number of high velocity atomic particles with small energy loss. Preferred embodiments of the exit window include those having cohesively joined layers of: aluminum and aluminum oxide.

3,778,656

ION SOURCE EMPLOYING A MICROWAVE RESONANT CAVITY

Charles Fremiot, Grenoble, and Jean Grando, Sassenage, both of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed July 26, 1972, Ser. No. 275,304
Claims priority, application France, July 29, 1971, 7127812
Int. Cl. H05h *13/00*
U.S. Cl. 313—63 11 Claims



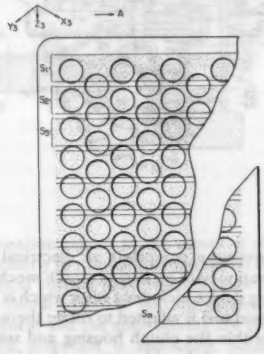
The ion source comprises a plasma source employing a microwave cavity which is excited in one of its modes of resonance and a static magnetic field adjusted to the electron cyclotron resonance, means for extracting the ions from the plasma and comprising an expansion cup pierced by an aperture which communicates with the cavity and ion-extraction electrodes brought to suitable potentials. The density of the plasma is of maximum value in the vicinity of the aperture and the static magnetic field is substantially zero in the vicinity of the extraction electrodes.

3,778,657

TARGET HAVING A MOSAIC MADE UP OF A PLURALITY OF P-N JUNCTION ELEMENTS

Shuji Kubo, and Hiroshi Naito, both of Osaka, Japan, assignors to Matsushita Electric Industrial Company, Kadoma, Osaka, Japan

Continuation-in-part of Ser. No. 859,448, Sept. 16, 1969, abandoned. This application Feb. 9, 1972, Ser. No. 224,991
Int. Cl. H01j *31/28*
U.S. Cl. 313—65 A 2 Claims



An image pick-up device has a target arranged to be scanned by an electron beam in a scanning direction and com-

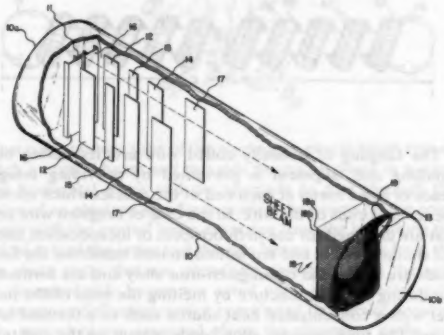
prising a semiconductor of P- or N- type substrate, and a plurarity of semiconductive regions of N- or P-type on the substrate and forming P-N junction elements spaced from and isolated from each other, which elements are so arranged that at least one axis defined by a line connecting the centres of successive most closely adjacent elements is oblique relative to the scanning direction.

3,778,658

MULTIBEAM CATHODE RAY TUBE UTILIZING D.A.M. GRID

Lawrence A. Harris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 1, 1972, Ser. No. 285,911
Int. Cl. H01j *29/46, 29/80*
U.S. Cl. 313—69 R **14 Claims**



An electron gun within a glass envelope generates a sheet electron beam which is focussed into a line on a phosphor screen positioned at the output end of the glass envelope. A plurality of parallel metal plates oriented in planes defined by the scan direction and normal to the phosphor screen are positioned within the glass envelope in close proximity to the phosphor screen. The plates are in the direct path of the sheet beam and result in the beam being divided into a plurality of parallel beams of number one less than the plurality of plates. Input signals simultaneously applied to the plates produce intensity modulation of the electron beams by generating electrostatic fields between adjacent plates in accordance with the input signal voltages and thereby control or modulate the fraction of each beam that passes between adjacent plates and reaches the screen. The plates thus function as a divide and modulate (D.A.M.) grid. Deflection coils or plates positioned between the electron gun and D.A.M. grid simultaneously deflect the sheet beam and resultant modulated beams in the scan (beam sweep) direction whereby the input signals can be simultaneously displayed on the screen.

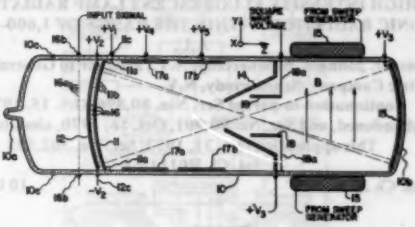
3,778,659

INVERTED IMAGE MULTIBEAM CATHODE RAY TUBE

John M. Houston, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 1, 1972, Ser. No. 285,912
Int. Cl. H01j *29/46, 29/52*
U.S. Cl. 313—69 R **21 Claims**

An electron gun within a glass envelope simultaneously emits a plurality of coplanar electron beams through corresponding apertures in a concave shaped electrode. The apertures are arranged in a single row along a vertical diameter of the concave electrode in the case where the sweep lines developed by the electron beams on an output phosphor screen are in a horizontal direction. A like plurality of grids are positioned between the concave electrode and a cathode, and are aligned with the concave electrode apertures. Input signals simultaneously applied to the grids produce intensity modulation of the electron beams. An anode positioned between the concave electrode and phosphor screen accelerates the electron beams along straight cross-over paths to



provide an inverted image on the screen. Deflection coils or plates positioned between the anode and screen simultaneously deflect all the electron beams in the sweep direction whereby the input signals can be simultaneously displayed.

3,778,660

FLUORESCENT LAMP OF HIGH COLOR RENDERING

Shigeru Kamiya, Hirakata, and Haruo Shibata, Takatsuki, both of Japan, assignors to Matsushita Electronics Corporation, Kadoma City, Osaka Prefecture, Japan

Filed June 11, 1971, Ser. No. 152,217
Claims priority, application Japan, June 12, 1970, 45/51186
Int. Cl. C09k *1/28, 1/36, 1/38*
U.S. Cl. 313—109 **3 Claims**

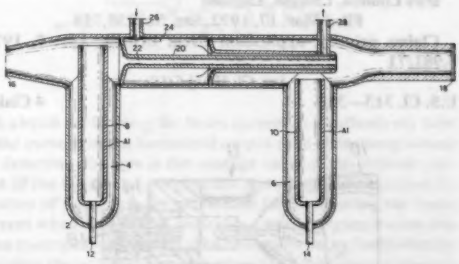
A low pressure mercury vapor fluorescent discharge lamp, having a color rendering value as high as 97 is obtainable by applying on the inner wall of the lamp a layer of a phosphor mixture comprising a basic magnesium arsenate phosphor containing 0.02 –0.2 gram-atom of manganese per 6 mols of magnesium oxide, magnesium tungstate, tin-activated strontium magnesium orthophosphate and antimony-and-manganese-activated calcium halophosphate.

3,778,661

ELECTRICAL GAS DISCHARGE LAMP

Aharon Gedanken, Nitzana 29, Givatayim; Joshua Jortner, Beeri 50, Tel Aviv; Abraham Szoke, Harakafot 22, Kfar Shmaryahu, and Baruch Raz, Hofien 7, Ramat Aviv, all of Israel

Filed Jan. 24, 1972, Ser. No. 220,090
Int. Cl. H01j *61/16*
U.S. Cl. 313—185 **5 Claims**



Electrical gas discharge lamps exhibiting an emission spectrum similar to the pure xenon molecular emission spectrum are characterized in that the gas in the lamps includes a mix-

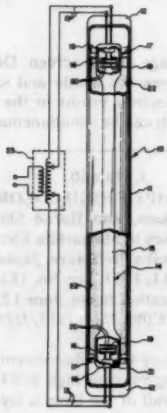
ture of xenon and argon the partial pressure of the xenon being less than 50 torr and constituting at least 50 parts per million of the gas mixture.

3,778,662

HIGH INTENSITY FLUORESCENT LAMP RADIATING IONIC RADIATION WITHIN THE RANGE OF 1,600–2,300 A.U.

Peter D. Johnson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. Nos. 80,896, Oct. 15, 1970, abandoned, and Ser. No. 80,901, Oct. 15, 1970, abandoned.
This application Oct. 31, 1972, Ser. No. 302,582
Int. Cl. H01j *1/62*
U.S. Cl. 313—109 **10 Claims**



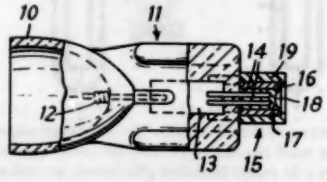
Very high intensity fluorescent lamp apparatus includes a lamp envelope having a coating therein of a phosphor which emits visible radiation when excited by far ultraviolet ionic radiation. Interior of the envelope, a far ultraviolet radiation source includes a pair of discharge electrodes and a suitable pressure of a vaporizable, ionizable metal together with a partial pressure of noble gas, the metal and noble gas being sufficient, under excitation of a high current density discharge to produce far ultraviolet ionic radiation at current densities of approximately one ampere per square centimeter or greater.

3,778,663

ELECTRIC LAMPS AND DISCHARGE DEVICES

Eric John George Beeson; Kenneth Frederick Furmidge; Horace Edward Stanyon, and John Rueben Thomas Speller, all of London, England, assignors to Thorn Electrical Industries Limited, London, England

Filed Mar. 17, 1972, Ser. No. 235,758
Claims priority, application Great Britain, Apr. 7, 1971, 8,981/71
Int. Cl. H01j *5/52*
U.S. Cl. 313—318 **4 Claims**



An end construction of an electric lamp or discharge device has an hermetic pinch seal through which an electrical lead-out conductor passes, the conductor terminating in a cap unit which includes an externally-insulated metal tube filled with brazing alloy. The cap unit enhances dissipation of heat from the seal and thereby improving resistance to failure of the lead-out conductor by oxidation.

3,778,664

BEADED COILS FOR ELECTRIC LAMPS AND SIMILAR DEVICES

James Petro, Little Falls, and Clair M. Rively, Old Bridge, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 792,988, Jan. 22, 1969, abandoned.
This application Dec. 22, 1972, Ser. No. 317,880
Int. Cl. H01j *1/16, 19/10*
U.S. Cl. 313—344 **18 Claims**

The tangling of helically coiled wire articles during bulk handling and shipment is prevented by providing integral beads of fused metal at each end of the articles which enclose the severed ends of the wire. In the case of tungsten wire coils that are designed for use in fluorescent or incandescent lamps and similar devices and are wound on iron mandrels, the fused beads are composed of tungsten-iron alloy and are formed in situ during coil manufacture by melting the ends of the mandrel with a concentrated heat source such as a focused laser beam. The tungsten-iron alloy beads remain on the end turns of the coil during the subsequent mandrel-dissolving operation, are ductile and are formed without embrittling the tungsten wire.

Various methods and apparatus embodiments for manufacturing such beaded-end coils on a mass production basis using a CO_2 laser are disclosed.

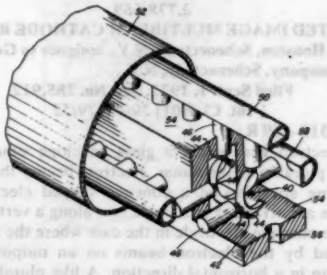
Since the beads can readily be made larger than the diameter of the coil and be spaced a predetermined distance apart, they provide built-in guides or "reference points" for mounting incandescent lamp type filament coils on their lead wires and thus accurately controlling the lighted-length of the mounted coils.

3,778,665

SLOW WAVE DELAY LINE STRUCTURE

Robert Harper, Concord, and David Zavadil, Newton Center, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Aug. 24, 1972, Ser. No. 283,460
Int. Cl. H01j *25/34*
U.S. Cl. 315—3.5 **12 Claims**



A slow wave guiding structure such as a helix delay line for electron interaction type devices of the traveling wave type is

disclosed having diamond heat sink supports for substantial enhancement of power levels of operation. The supports are bonded to metallic members to dissipate thermal energy. The invention is applicable to numerous slow wave structures including ladder, ring-bar, meander, as well as interdigital types.

3,778,666

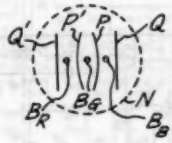
CONVERGENCE DEFLECTING DEVICE FOR SINGLE-GUN, PLURAL-BEAM COLOR PICTURE TUBE

Senri Miyaoka, Kanagawa, and Minoru Morio, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 813,827, April 7, 1969, Pat. No. 3,619,687. This application June 8, 1971, Ser. No. 151,003

Int. Cl. H01j 29/50

U.S. Cl. 315—13 C **3 Claims**



In a color picture tube of the single-gun, plural-beam type in which a central beam and two side beams originate in a common horizontal plane and are all made to pass through the center of an electron lens for focussing the beams on the color screen with the central beam emerging from the lens along the optical axis of the latter and the side beams emerging from the lens along paths that are oppositely divergent from the axis, the divergent side beams are acted upon by an electrostatic convergence deflecting device constituted by pairs of horizontally spaced plates arranged along the divergent paths and having voltages applied thereacross to produce electric fields by which the divergent side beams passing therethrough are deflected to converge at a common spot with the central beam on the apertured grill or mask associated with the screen, and a main deflection yoke produces magnetic fields by which the beams are deflected horizontally and vertically, respectively, for causing the beams to scan the screen; the horizontal distances between the plates of each pair are varied in the vertical direction from a maximum at the common horizontal plane to minimums at the opposed edges of the plates remote from such common plane so as to correspondingly vary the strengths of the electric fields and thus correct distortions in the rasters of the side beams.

3,778,667

DISPLAY CONTROL APPARATUS FOR DRAWING ACCURATE LINES

Gordon Hughes, Macclesfield, England, assignor to International Computers Limited, London, England

Filed May 11, 1972, Ser. No. 252,297

Claims priority, application Great Britain, May 15, 1971, 15,153/71

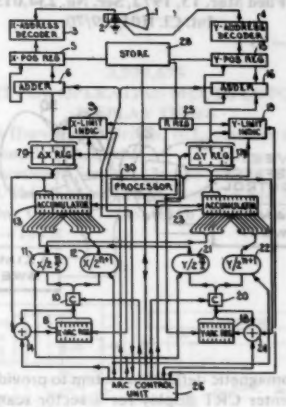
Int. Cl. H01j 29/70

U.S. Cl. 315—18 **9 Claims**

The development of a simplified arrangement for drawing arcuate lines on a display, such as a cathode ray tube face, by the successive specification of a sequence of displacement positions is explained, and apparatus is described for calculating the sequence of displacement positions by relative right-shifting and selective addition of a pair of initially calculated values, one for each of two co-ordinate axes.

The apparatus includes a first register for each of the initial values and an accumulator for each axis, the values from the first registers being entered into each of the accumulators to form a new value. The resultant values are used to specify a drawing displacement for each axis and are recirculated to replace the values in the first registers, this cycle of events being repeated as required until the line is drawn.

Where an arc extends beyond a quadrant bounded by the axes the signs of the values entered into the accumulators are changed as required for drawing an arc in the new quadrant.



The change of sign is effectively accomplished by selective complementing of the values as they are entered into the accumulators.

3,778,668

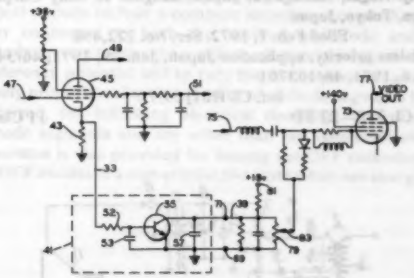
AUTOMATIC BEAM CURRENT LIMITER

Jack R. Chipman, and Donald McCombs, both of Fort Wayne, Ind., assignors to The Magnavox Company, Fort Wayne, Ind.

Filed Jan. 24, 1972, Ser. No. 220,087

Int. Cl. H01j 29/70

U.S. Cl. 315—30 **8 Claims**



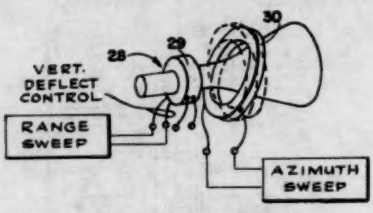
A circuit for limiting the beam current in a cathode ray tube or the current in the horizontal output tube comprising means for detecting changes in the average value of the cathode current of the horizontal output tube and providing an output indicative of these changes and means for diminishing the beam current when that output indicates a predetermined value has been exceeded is disclosed. The beam current is diminished by coupling the collector-emitter circuit of a switching transistor to an impedance intensity point in the receiver such as the brightness or bias control potentiometers and driving that switching transistor from the voltage across a capacitor which represents the average value of the current flowing in the horizontal output tube.

3,778,669

MAGNETIC DEFLECTION SYSTEM FOR DEPRESSED-CENTER SECTOR SCAN DISPLAY

George P. Cooper, Corona Del Mar, and Thomas H. Moore, Santa Ana, both of Calif., assignors to North American Rockwell Corporation, El Segundo, Calif.

Filed Mar. 13, 1972, Ser. No. 234,015
Int. Cl. H01j 29/70
U.S. Cl. 315—23 15 Claims



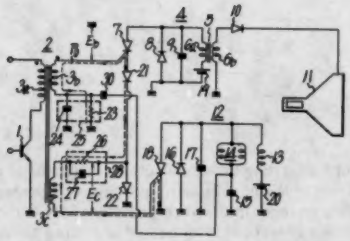
An electromagnetic deflection system to provide a low-cost, depressed-center CRT display for a sector scanning sensor. An auxiliary coil (usually a ring) is wound about a cathode ray tube, axially spaced intermediate the conventional deflection yoke and the display face of the CRT, and oriented relative to the longitudinal axis of the tube to provide a resultant magnetic vector which is mutually angled relative to such longitudinal axis. The deflection system can be driven by conventional low cost flyback deflection circuits producing sawtooth deflection currents. For example, in a display for an azimuthally scanning radar, the radar range sweep generator frequency output need be applied only to the vertical deflection winding of the conventional deflection yoke, while the radar azimuth scan frequency is applied either to the auxiliary coil alone or to the auxiliary coil and the horizontal deflection winding of the conventional deflection yoke in series.

3,778,670

HORIZONTAL DEFLECTION CIRCUIT

Tamiji Nagai, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 1, 1972, Ser. No. 222,498
Claims priority, application Japan, Jan. 29, 1971, 46/3404; Nov. 6, 1971, 46/103701
Int. Cl. H01j 29/70
U.S. Cl. 315—27 TD 11 Claims



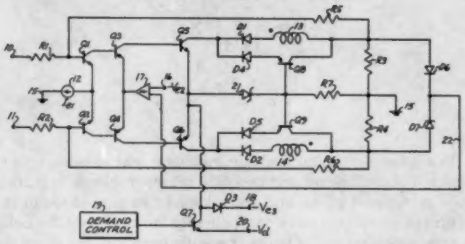
A solid-state horizontal deflection circuit including a high voltage applying circuit for a television receiver or the like in which a gate-controlled switching device is used for applying a deflection current to a horizontal deflection coil to perform horizontal beam scanning and another semiconductor switching device is used for applying a pulse voltage to a flyback transformer to produce a high voltage supplied to a cathode ray tube, and further a couple of diodes connected in series are provided in connection with the above two switching devices. Both switching devices are turned on in response to a horizontal driving signal supplied to at least one of them and turned off by the recovery current of the series-connected diodes.

3,778,671

DIFFERENTIAL MAGNETIC DEFLECTION AMPLIFIER

Fred William Erickson, Northridge, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Sept. 29, 1971, Ser. No. 184,881
Int. Cl. H01j 29/70
U.S. Cl. 315—27 TD 10 Claims



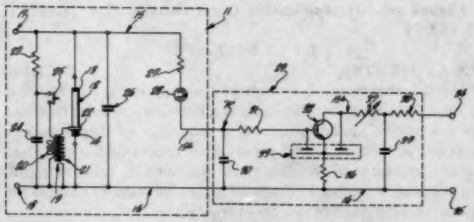
A differential magnetic deflection amplifier comprises a plurality of cascaded Class A biased emitter-coupled differential amplifier stages driving a high current output stage operated in a Class A-B bias. An antisaturation clamp is provided to assure linearity of feedback signals during major position moves, and voltage-on-demand means is provided to reduce power dissipation.

3,778,672

AUDIBLE ALERT SIGNAL FOR AN ELECTRONIC FLASH UNIT

Gerald F. Fountain, Santa Monica, Calif., assignor to Ponder & Best, Inc., Los Angeles, Calif.

Filed July 27, 1972, Ser. No. 275,690
Int. Cl. H05b 37/02
U.S. Cl. 315—133 18 Claims

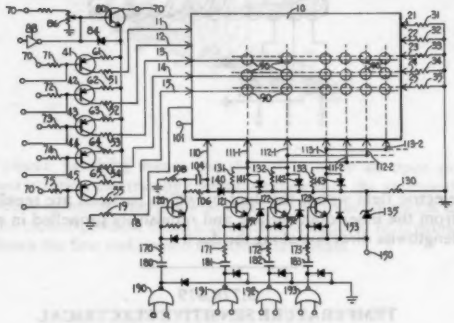


A circuit in an electronic flash unit including an audio oscillator for providing an audible alert signal to indicate the "ready" state of the flash unit.

3,778,673
LOW POWER DISPLAY DRIVER HAVING BRIGHTNESS CONTROL

Mark F. Eisenberg, and George E. Holz, both of North Plainfield, N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed June 21, 1971, Ser. No. 154,729
Int. Cl. H05b 37/00
U.S. Cl. 315—169 7 Claims

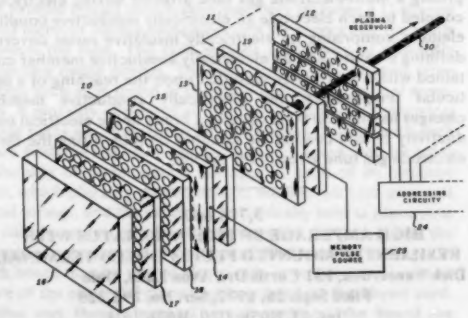


Low power drive apparatus connected for operating display devices including a plurality of gas-filled cells and gas communication channels extending between adjacent columns of cells for scanning of them by glow transfer from column to column. The driving apparatus includes series-connected drive circuits for the display control anodes of the devices, operated in the current-controlling mode of the input data signals. The display anode drivers are connected as controllable current sources which do not saturate when activated. A variable voltage device is connected to the current drivers for controlling the brightness of the display by regulating the amount of current conducted to the display cells when activated.

3,778,674
D. C. GAS DISCHARGE DISPLAY APPARATUS WITH PULSE TRAIN MEMORY SUSTAINING POTENTIAL

Claude D. Lustig, Lexington, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 14, 1972, Ser. No. 244,011
Int. Cl. H05b 37/00
U.S. Cl. 315—169 R 7 Claims

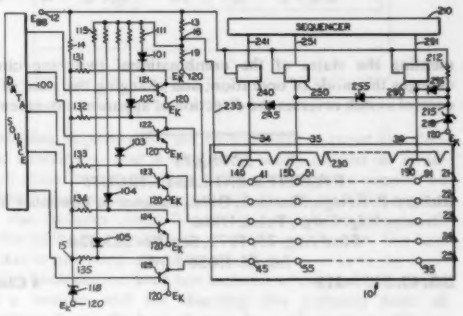


Display apparatus comprises d.c. gas discharge display cells with a sustaining potential thereacross comprising a pulse train with pulse amplitude, pulse duration and pulse spacing such that an ignited cell is reignited upon application of each sustaining pulse and an extinguished cell remains extinguished upon application of the sustaining pulses unless ignited or extinguished by external means.

3,778,675
CIRCUIT FOR OPERATING MULTIPLE POSITION DISPLAY TUBES

Edgar Lloyd Harvey, Old Bridge, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 126,825, March 22, 1971, abandoned. This application Jan. 16, 1973, Ser. No. 324,023
Int. Cl. H01j 17/48; H05b 37/00, 41/00
U.S. Cl. 315—169 R 21 Claims



The disclosed apparatus is adapted for operating multiple position display devices having several groups of display cathode segments or elements, with corresponding elements electrically interconnected, an anode associated with each group of segments, and an auxiliary electrode common to all of the groups of electrodes for electrically isolating the electrode groups and preventing spurious glow between them. The subject circuits include a common impedance or a voltage divider connected to both the auxiliary electrode and the cathode drivers to bias the auxiliary electrode proportional to a reference potential and to vary the common impedance inversely proportional to the number of cathode segments being energized, for inhibiting electrical discharge between the cathode segments and any other than the associated anode. Apparatus is also provided for biasing the OFF cathodes and the OFF anodes in a non-conductive state when not energized.

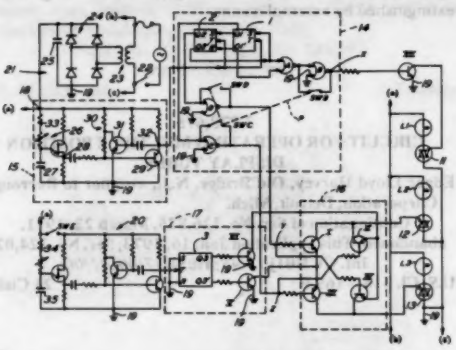
3,778,676
CONTROL APPARATUS FOR SELECTIVELY ILLUMINATING A GROUP OF LAMPS

John M. Keller, 7918 Roosevelt Blvd., Philadelphia, Pa.

Filed June 7, 1971, Ser. No. 150,314
Int. Cl. H05b 37/02
U.S. Cl. 315—217 12 Claims

Control apparatus associated with a group of three lamps selectively illuminates the lamps in predetermined sequences, there being a mode in which the sequence creates an illusion in the eye of an observer of a moving light spot surrounded by darkness, and a mode in which it appears that a moving dark spot is surrounded by light. The apparatus includes a three-state combinational switching circuit having one input which controls the illumination of one lamp; the two other outputs of the circuit, together with a two-state control switch, establish

the state of a four element switching network which in turn controls the illumination of the other two lamps. Complementing the states of the combinational switching circuit changes the mode of operation; and changing the state of the control switch reverses the direction of apparent movement.

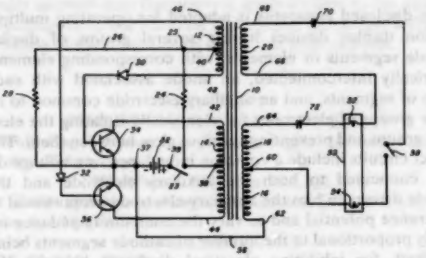


3,778,677

INVERTER BALLAST CIRCUIT

Richard P. Kriege, Skiatook, Okla., assignor to Lowrance Electronics Mfg. Corp., Tulsa, Okla.

Filed Aug. 25, 1972, Ser. No. 283,824
Int. Cl. H05b *37/02*
U.S. Cl. 315—219 **4 Claims**



This invention describes a circuit for providing high voltage A.C. potential for the initiation of discharge, and for powering a fluorescent lamp, from a low voltage battery. A principal improvement lies in the use of an additional secondary winding to raise both filaments of the fluorescent lamp to a high voltage A.C. above the ground plane of the battery. This induces ionization inside of the lamp tube by capacitive coupling to the ground plane, and permits more prompt initiation of the discharge in the lamp.

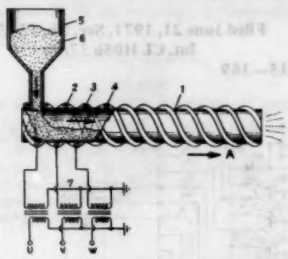
3,778,678

APPARATUS FOR ELECTRIC FIELD CURTAIN OF CONTACT TYPE

Senichi Masuda, 40-10-605,1-chome, Nishigahara, Kita-ku, Tokyo, Japan

Filed Feb. 16, 1972, Ser. No. 226,750
Int. Cl. B05b *5/02*
U.S. Cl. 317—3 **2 Claims**

A tubular duct of insulating material has three elongated electrodes spirally wound along it on its outer surface, uniformly spaced from one another. The electrodes are connected with the terminals of an alternating current source having a voltage of the order of 5–10 KV to produce a wave-like electric field within the duct by which particles are repelled from the inner duct surface and repulsively propelled in one lengthwise direction along the duct.



3,778,679

TEMPERATURE SENSITIVE ELECTRICAL REGULATING DEVICE

Gaylord D. Jonassen, Smithtown, N.Y., assignor to Telecommunication Industries, Inc., Copiague, N.Y.

Filed Dec. 8, 1972, Ser. No. 313,584
Int. Cl. H02h *5/04*
U.S. Cl. 317—40 A **13 Claims**

A Temperature Sensitive Electrical Regulating Device comprising a multi-electrode gas tube arrestor having electrically coupled to each electrode an electrically conductive coupling element comprising an electrically insulative outer covering defining a cavity, and an electrically conductive member contained within said cavity such that upon the reaching of a particular temperature, the electrically conductive member changes its physical state causing a break in the electrical conductivity of said conductive member thereby lifting the three electrode gas tube arrestor off the line.

3,778,680

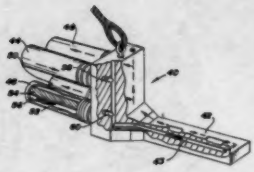
HIGH AMPERAGE SWITCH APPARATUS WITH RESILIENTLY MOUNTED FLUID COOLED TERMINALS

Dick Vaneerden, 131 Curtis Dr., Avon Lake, Ohio

Filed Sept. 26, 1972, Ser. No. 292,329
Int. Cl. H05k *7/20*; **H02b** *1/04*
U.S. Cl. 317—100 **10 Claims**

A high amperage electrical switching apparatus especially adapted for use in a corrosive atmosphere is provided which comprises a housing, a pair of spaced apart first and second

electrical terminals which extend from the housing having fluid cooling means associated therewith, electrical conducting means positioned inside of the housing which communicate electrically with the first and second electrical terminals and are provided with fluid cooling means, and electri-



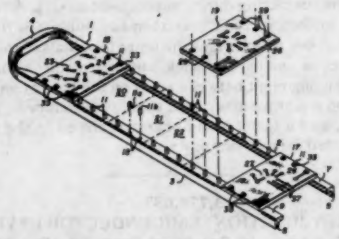
cal circuit breaking means capable of being in an open or closed position electrically communicating with the electrical conducting means whereby when the circuit breaking means is in the closed position electrical current is capable of flowing between the first and second electrical terminals.

3,778,681

MODULAR PRINTED CIRCUIT BOARD ASSEMBLY

Randy Eugene Wilson, Springfield, Mo., assignor to Litton Systems, Inc., Springfield, Mo.

Filed Aug. 23, 1972, Ser. No. 283,196
Int. Cl. H05k 1/04
U.S. Cl. 317—101 DH **3 Claims**



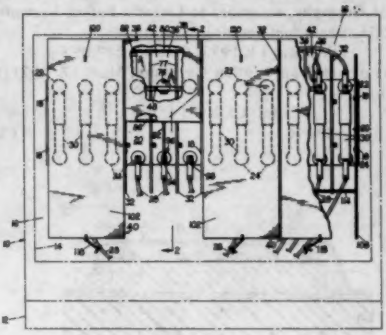
A printed circuit card holder assembly includes a U-shaped metal member having elongated rails for supporting the cards between the rails. The rails include a plurality of upwardly projecting metal prongs. The rails are of an L-shaped cross section such as is found in common aluminum channel members. A plurality of printed circuit boards containing electrical circuit paths are mounted side by side along the rails with each board bridging the two rails. Each circuit board card includes a plurality of metal walled passages at each of its opposed ends, which plurality corresponds in number with the adjacent metal prongs, and the cards are individually held in place atop the rails by means of a friction fit between the prongs and the passages in the printed circuit board. One or more passages in each board may be placed electrically in common with one or more of the electrical circuit paths printed on the circuit card. In this way those electrical circuit paths on the board are placed electrically in common with the metal rails. And each circuit board may be individually inserted or removed from the supporting metal member without disturbing the remaining circuit boards.

3,778,682

SHIELDING APPARATUS FOR ELECTRICAL EQUIPMENT

William L. Bright, 0605 S.W. Curry St., Portland, Oreg.

Filed Dec. 6, 1971, Ser. No. 204,857
Int. Cl. H02b 1/14
U.S. Cl. 317—119 **10 Claims**



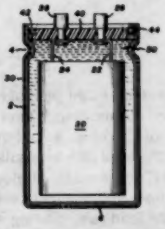
Shielding apparatus for use by workmen to cover live electrical contacts so that work can be safely carried on in adjacent areas. A base bracket includes a flange for support on upright barrier walls associated with the electrical equipment and also includes clamp fingers for securely attaching such bracket to the barriers in supported relation thereon. The base bracket in turn supports a first shielding box or cover by overlapping hook means. Such box includes a front wall, side walls, and a bottom wall for shielding live contacts from all directions from which work may be performed in adjacent areas by workmen. Tie-down means are associated with the shielding box for anchoring it securely in place. One or more second shielding boxes are provided having greater length than the first shielding box to shield additional live contacts in adjacent areas. The second shielding boxes also includes tie-down means for anchoring them in a supported position. The base bracket and shielding boxes are constructed of electrically insulating material and each is provided with eye means for handling them by an insulated stick.

3,778,683

SELF-BONDING CAPACITOR CASE INSULATION

Joel B. Buice, and David G. Schwenker, both of Columbia, S.C., assignors to General Electric Company, Owensboro, Ky.

Filed Aug. 28, 1972, Ser. No. 284,440
Int. Cl. H01g 9/00
U.S. Cl. 317—230 **4 Claims**



An improved aluminum electrolytic capacitor is provided having an electrically insulating coating securely bonded to the casing. The coating comprises an epoxy resin preferably

applied as a powder and cured to the empty casing at an elevated temperature to secure a proper bond without damage to the electrical components subsequently assembled therein.

3,778,684

SEMICONDUCTOR ELEMENT AND METHOD OF MAKING IT

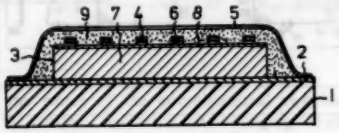
Horst Fischer, Heilbronn, and Eduard Justi, Braunschweig, both of Germany, assignors to Licentia Patent-Verwaltungs G.m.b.H., Frankfurt am Main, Germany

Filed Jan. 13, 1972, Ser. No. 217,597

Claims priority, application Germany, Mar. 17, 1971, P 21 12 812.1

Int. Cl. H01l 15/00

U.S. Cl. 317—234 R **9 Claims**



A semiconductor element comprises a semiconductor body with at least one metal electrode mounted thereon, a conducting layer consisting at least partly of palladium, rhenium or rhodium being provided between the metal electrode and the semiconductor body. A method of manufacturing such a semiconductor element is also disclosed.

3,778,685

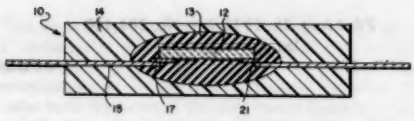
INTEGRATED CIRCUIT PACKAGE WITH LEAD STRUCTURE AND METHOD OF PREPARING THE SAME

Bobby W. Kennedy, Arab, Ala., assignor to The United States of America as represented by the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 27, 1972, Ser. No. 238,047

Int. Cl. H01l 3/00, 5/00

U.S. Cl. 317—234 R **6 Claims**



A beam-lead integrated circuit package assembly including a beam-lead integrated circuit chip, a lead frame array bonded to projecting fingers of the chip, a rubber potting compound disposed around the chip and an encapsulating molded plastic. The lead frame array is prepared by photographic printing of a lead pattern on a base metal sheet, selectively etching to remove metal between leads and plating with gold. Joining of the chip to the lead frame array is carried out by thermocompression bonding of mating gold-plated surfaces. A small amount of silicone rubber is then applied to cover the chip and bonded joints, and the package is encapsulated with epoxy resin, applied by molding.

3,778,686

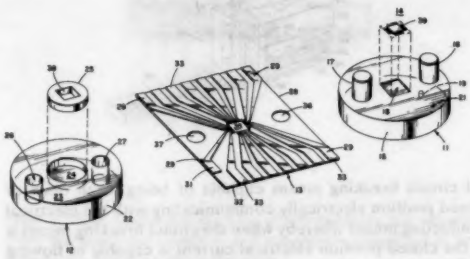
CARRIER FOR BEAM LEAD INTEGRATED CIRCUITS

Lee Robert Galvin, Lafayette, and Arthur J. Kline, Jr., Scottsdale, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 18, 1972, Ser. No. 281,641

Int. Cl. H01l 5/00

U.S. Cl. 317—234 R **15 Claims**



A carrier for beam lead integrated circuits is disclosed wherein a pair of optically-clear, electrically-insulating base and cover members are disposed with major surfaces facing each other. A depression in the base member is adapted to accurately position the integrated circuit with its beam leads facing toward the depression. A fan-out circuit comprising a self-supporting film having metallic film circuits thereon is disposed between the major surfaces of the base and cover members with the inner terminals of the film circuits engaging the back surfaces of the beam leads. A hole in the fan-out circuit receives the body of the beam lead integrated circuit.

The outer terminals of the metallic film circuits extend beyond the edges of the base and cover members and are available for contacting during subsequent testing. A recess in the major surface of the cover member holds a soft rubber pressure member which urges the inner terminals of the metallic film circuits against the back surfaces of the beam leads. Frictional engagement between studs on the base member and holes on the cover member hold these two members, the fan-out circuit, and a beam lead integrated circuit in the depression assembled for carrying and testing.

3,778,687

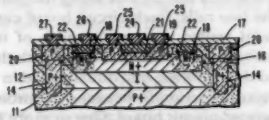
SHALLOW JUNCTION SEMICONDUCTOR DEVICES

Joseph J. F. Chang, 19 Brookland Farm Rd., Poughkeepsie, N.Y., and Madhukar B. Vora, 4 Half Moon Rd., Beacon, N.Y.

Division of Ser. No. 765,328, Oct. 7, 1968, Pat. No. 3,603,468. This application Apr. 20, 1971, Ser. No. 135,680

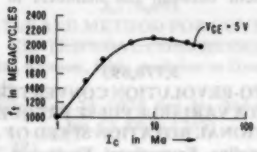
Int. Cl. H01l 9/12, 11/08, 3/12

U.S. Cl. 317—235 R **4 Claims**



A high performance PN silicon semiconductor device having an arsenic or antimony doped N region which gives a substantial improvement over similar phosphorous doped regions.

Arsenic atoms in the N type emitter region of an NPN device tends to squeeze the P-type impurity, such as boron in the base



into a narrow-base layer. For the same integrated base doping, a much narrower base can be obtained with arsenic-doped emitters than with phosphorous-doped emitters.

3,778,688

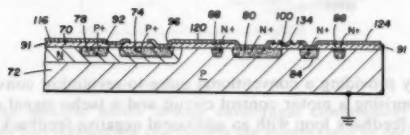
MOS-BIPOLAR HIGH VOLTAGE DRIVER CIRCUIT

Robert Hudson Crawford, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 758,253, Sept. 9, 1968, abandoned. This application Mar. 15, 1971, Ser. No. 124,436

Int. Cl. H01l *11/00*

U.S. Cl. 317—235 G **9 Claims**



A monolithic circuit for driving a high voltage numerical readout device such as a NIXIE tube is described which has a driver circuit for each numerical output that includes an NPN bipolar transistor and a p-channel enhancement mode field effect transistor for controlling the emitter current of the bipolar transistor. A four bit binary-to-decimal decoder formed by p-channel MOSFETs control the gate voltages of the MOSFETs of each driver circuit. The MOSFETs of both the logic circuit and the driver circuits are formed by p-type diffusions in an n-type epitaxial region grown in a p-type substrate, while the bipolar transistors are formed by n-type diffusions in the p-type substrate. The bipolar transistors include an inversion preventing electrode over the base region and an n-type diffused guard ring. The integrated circuit also includes a voltage controllable multivibrator for duty cycle modulating the drive current to control the degree of illumination of the numerical readout.

3,778,689

THIN FILM CAPACITORS AND METHOD FOR MANUFACTURE

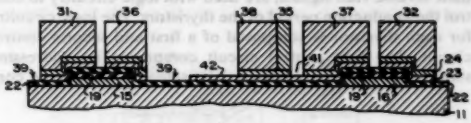
George E. Bodway, Los Altos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 56,610, July 20, 1970, abandoned. This application May 22, 1972, Ser. No. 255,889

Int. Cl. H01g *1/01*

U.S. Cl. 317—258 **12 Claims**

A thin film capacitor and resistor circuit is disclosed, each capacitor being formed by a structure including a metallic film of an insulating substrate, the metallic film having an oxidized surface formed by anodizing, an oxide layer on the oxidized surface of the metallic film, and a pair of spaced-apart conductor layers over the oxide layer, each resistor being formed by a resistive film on the substrate and a pair of spaced-apart conductor layers connecting with the ends of the resistive film. In the manufacture of the circuit, a predeposited substrate is



produced that may be utilized by circuit designers in the subsequent fabrication of custom microcircuits. A heat treating technique is employed in trimming the resistors of the circuit.

3,778,690

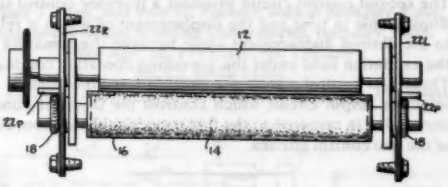
ELECTROSTATIC COPYING MACHINE

Francis N. Rothacker, Valhalla, N.Y., and David P. Bujese, Toms River, N.J., assignors to Copy Research Corporation, Elizabeth, N.J.

Filed Mar. 16, 1972, Ser. No. 235,346

Int. Cl. G03g *15/02*

U.S. Cl. 317—262 A **17 Claims**



In a copying machine employing two conductive rollers to which zinc oxide coated copy paper is fed, the power source provides a DC voltage between the rollers that is derived from a frequency (of 25 kilocycles, for example) which is relatively high compared to line frequency. The relatively high frequency ripple that is on the DC output eliminates much of the problem with discernible lines on the end product. One of the two rollers has a rubber sleeve which is selected to provide a low capacitance such as 75 micro-microfarads. The resistance of the sleeve is such that a current flow of 50 microamperes is obtained with a 3,000 volt potential between the two rollers. The low capacitance means that when a sheet of copy paper is fed between the rollers, the change in the potential across the rubber sleeve and the change in current flow will occur very rapidly so that an even charge is applied on the copy paper. Because of the relatively high frequency employed, the ripple factor is kept low and the voltage magnitude applied is kept down to a point where the amount of ozone generated is minimized.

3,778,691

CONTROL CIRCUIT FOR AN ELECTRIC MACHINE HAVING AN ELECTRONIC COMMUTATOR

Herbert Poppinger, Erlangen-Sieglitzhof, and Klaus Huber, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 17, 1972, Ser. No. 281,493

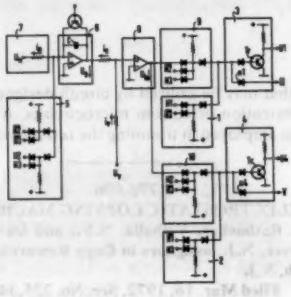
Claims priority, application Germany, Aug. 20, 1971, P 21 41 622.8

Int. Cl. H02k *29/02*

U.S. Cl. 318—254 **9 Claims**

A control circuit is disclosed for a converter fed electric machine in which thyristors, arranged in separate channels,

are used as an electronic commutator. A rotor position transmitter in conjunction with three Hall effect generators produces pulsed signals mutually displaced 120 electrical degrees from each other. These signals, in combination with their inverse Hall signals, are used with logic circuitry to control the conduction period of the thyristors. The logic circuitry for each thyristor is composed of a first and second control circuit. The first control circuit comprising an addressing stage or NOR gate provides a pulse signal to control the con-



duction of the thyristor to insure maximum torque on starting. The second control circuit provides a thyristor control signal displaceable in time and the displacement of which is related to the desired displacement angle between the armature and the excitation field under the prevailing operating conditions. These two control signals are provided as input signals to a selective output circuit which controls the thyristor conduction period in response to the first occurring signal from either of the two control circuits.

3,778,692

ARRANGEMENT FOR SETTING THE SPEED OF AN ELECTRONIC MOTOR, PARTICULARLY THE MOTOR OF AN INDUSTRIAL SEWING MACHINE

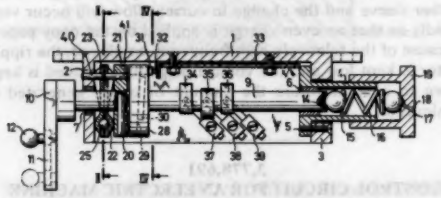
Wolfgang Angersbach, Darmstadt, and Karl-Heinz Meier, Zeilhard, Darmstadt, both of Germany, assignors to Quick-Rotan Becker & Notz KG, Darmstadt, Germany

Filed July 13, 1972, Ser. No. 271,531

Claims priority, application Germany, May 16, 1971, P 21 35 777.7

Int. Cl. G01r *33/06*

U.S. Cl. 318—305 **22 Claims**



A position-responsive electrical transducer comprises a magnetic member and a flux-responsive member adapted to produce an electrical signal indicative of magnetic flux strength. The members are mounted and spaced apart from each other in a first direction, and at least one of the members is movable relative to the other of the members in a second direction transverse to the first direction. A cam arrangement, or another arrangement which defines a path of motion, serves to effect relative movement between the members in said first direction as a predetermined function of relative movement between the members in said second direction. In this way, the distance between the members and thus the magnitude of the generated signal are varied as a predetermined function of relative movement between the members in said second direction.

3,778,693

PULSE-TO-REVOLUTION CONVERTER FOR CONVERTING A VARIABLE PULSE FREQUENCY INTO A PROPORTIONAL ROTATION SPEED OF A SHAFT

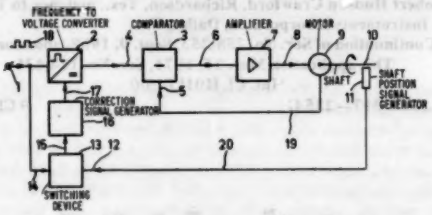
Aart Gerrit Korteling, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 30, 1972, Ser. No. 285,024

Claims priority, application Netherlands, Sept. 6, 1971, 7112272

Int. Cl. H02p *5/16*

U.S. Cl. 318—314 **5 Claims**



By providing a conventional pulse-to-revolution converter comprising a motor control circuit and a tacho signal negative-feedback loop with an additional negative-feedback loop an exact ratio is obtainable between the variable pulse repetition frequency of a pulse train and the rotation speed of a rotating shaft coupled to the motor. The shaft carries a shaft position pick-up which via a switching device operates a correction signal source.

3,778,694

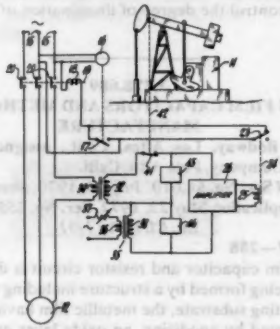
ELECTRIC MOTOR CONTROL SYSTEM FOR A BEAM-TYPE PUMPING LOAD

Laurence M. Hubby, Bellaire, and Herbert J. Mayer, Houston, both of Tex., assignors to Texaco, Inc., New York, N.Y.

Filed June 5, 1972, Ser. No. 259,890

Int. Cl. H02p *1/04*

U.S. Cl. 318—474 **3 Claims**



An electric motor-control system. The motor load is a beam-type pumping unit which has an upstroke and a

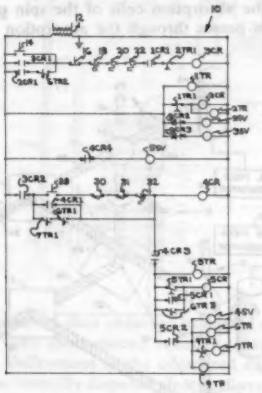
downstroke in each cycle. Loss of normal load during the downstroke only is detected by comparison with a preset normal-load signal and the motor is shut down.

3,778,695

APPPARATUS AND METHOD FOR CONTROLLING A CENTRIFUGAL COMPRESSOR

Paul Bauer, Jr., Rawson, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 21, 1972, Ser. No. 246,478
Int. Cl. F04b *27/00*
U.S. Cl. 318—481 **17 Claims**



In an electric motor driven centrifugal compressor, apparatus and method for controlling the compressor to prevent "surge" and operation at a motor current above the maximum rated motor current and for automatically restarting the compressor after a short-term power failure. The current to the compressor motor is sensed as an indicator of impending "surge". When the current falls below a pre-selected minimum value, a blow-off valve in the compressor outlet line is gradually opened to allow excess volume to escape to the atmosphere, thus avoiding "surge". The current to the motor is also sensed as an indication of compressor operation above the maximum rated motor capacity. When the motor current rises above a pre-selected level, an inlet valve to the compressor is closed. This restricts the volume available for compression and prevents motor over-loaded operation. In the event of a short-term power failure or power dip, contact pairs controlled by time delay relays remain closed for a short period of time. These pairs provide parallel bypass circuits around the normal motor starting circuits and allow an automatic restart if the time period has not been exceeded. The compressor is powered by the flywheel effect of its main drive gear during these short-term power failures. If the power failure is of a long enough duration, the bypass contact pairs open, and the normal restarting procedures must be followed.

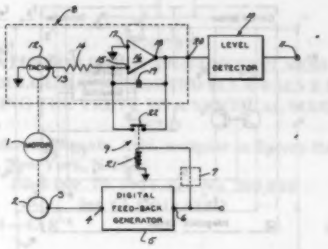
3,778,696

FEEDBACK FAULT INDICATE CIRCUIT

Ronnie G. Walters, Mayfield Heights; Theodore J. Markley, Mentor, and Richard E. Jennings, Wickliffe, all of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed June 23, 1972, Ser. No. 265,928
Int. Cl. G05b *23/02*
U.S. Cl. 318—565 **8 Claims**

In the servo system of a numerically controlled machine the position feedback signal is monitored by a fault indicate circuit. An absolute analog position signal is generated by an integrator circuit connected to receive a signal proportional to machine speed. Under normal operating conditions, the integrator circuit is repeatedly reset to zero by a reference reset switch and the magnitude of the absolute position signal is thus maintained below a preset limit. The reference reset switch is controlled by the position feedback signal being



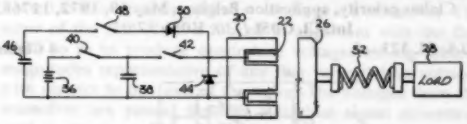
monitored and when the feedback signal is lost due to a malfunction, the integrator circuit is not reset and the absolute analog position signal rises above the preset limit. This condition is sensed by a level detector which generates a fault indicate signal.

3,778,697

SOLENOID ACTUATORS AND GENERATORS AND METHOD OF USING SAME

William T. Link, and Peer M. Portner, both of Berkeley, Calif., assignors to Arkon Scientific Laboratories, Berkeley, Calif.

Filed Apr. 26, 1971, Ser. No. 137,230
Int. Cl. H02k *35/02*
U.S. Cl. 322—3 **19 Claims**



Solenoid actuators capable of high speed operation and high efficiencies are disclosed. The solenoids, in the most efficient embodiment, are coupled to the driven member (i.e., load) through a spring (i.e., decoupled) which spring is selected (i.e., matching) to allow high initial acceleration of the armature, followed by deceleration of the armature near the end of the stroke as a result of the spring force, thereby minimizing i^2R losses and minimizing loss in kinetic energy by armature impact at the end of the stroke. To effectively accomplish the decoupling and matching, various methods of latching the solenoid at the end of the stroke, while the energy stored in the spring is delivered to the load, are disclosed, as are methods for decreasing the solenoid current from a high initial value so as to minimize resistive power lost in the winding. Solenoid generators using the principles of the present invention are also disclosed.

3,778,698

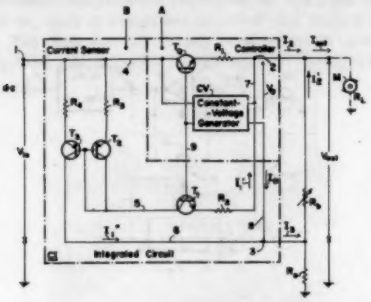
INTEGRATED VOLTAGE STABILIZER WITH NEGATIVE INTERNAL RESISTANCE

Aldo Romano, Monza, Italy, assignor to Ates Componenti Elettronici, S.p.A., Milano, Italy

Filed Aug. 24, 1972, Ser. No. 283,423
Claims priority, application Italy, Aug. 25, 1971, 27839 A/71
Int. Cl. G05f *1/56*
U.S. Cl. 323—4 **7 Claims**

An integrated voltage-stabilizing network with grounded substrate has an input terminal, an output terminal and a

reference terminal, the latter being held at a fixed potential relative to the output terminal by a regulator also delivering a constant current to that reference terminal which is connected to a tap on a voltage divider inserted between the output terminal and ground. The regulator is connected in the



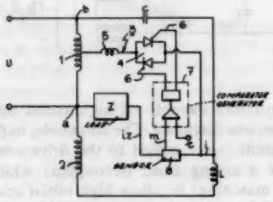
base/emitter circuits of two parallel transistors which lie between the input and output terminals and deliver respective components of an output current, one of these parallel transistors lying in series with a further transistor which is paired with a similar transistor supplying a like current components to the reference terminal.

3,778,699

RESONANT TYPE CURRENT REGULATOR PROVIDING A CONTINUOUS REGULATION

Marcel E. Hoffman, Lasne-Chapelle-Saint-Lambert, Belgium, assignor to Societe Anonyme des Etablissements Adrien De Backer, Leuvenbaan, Zaventem, Belgium

Filed Aug. 16, 1972, Ser. No. 281,256
Claims priority, application Belgium, May 19, 1972, 117683
Int. Cl. G05f 1/30; H05b 37/02
U.S. Cl. 323—6 **4 Claims**



A resonant type current regulator in which a controlled inductive impedance is provided in series or in shunt connection with the current path. A control is provided to vary the impedance value of the inductive impedance in response to the load current deviating from a reference value in a manner to stabilize the load current. An antiparallel arrangement of a pair of controlled semiconductor devices can be used for the controlled inductive impedance their control gates receiving control signals at times in each current half period which depend on the magnitude of the current deviation.

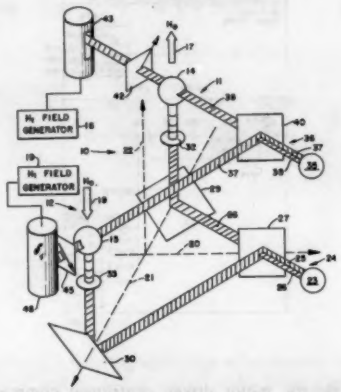
3,778,700

OPTICALLY PUMPED NUCLEAR MAGNETIC RESONANCE GYROSCOPE

Donald S. Bayley, Bedford, N.Y.; Ivan A. Greenwood, Jr, Stamford, Conn., and James H. Simpson, Jr, Katonah, N.Y., assignors to Singer-General Precision, Inc., Little Falls, N.J.

Filed June 7, 1971, Ser. No. 150,486
Int. Cl. G01r 33/08
U.S. Cl. 324—0.5 R **18 Claims**

A nuclear magnetic resonance gyroscope which obtains rotational information from the phases of precessing nuclear magnetic moments for determining the angle of rotation of the gyroscope about a sensitive axis. The gyroscope comprises a pair of spin generators each having a mercury absorption cell containing ^{199}Hg and ^{201}Hg. The cells are arranged so that each cell is subjected to a DC H_0 magnetic field and to an AC H_1 magnetic field in a direction perpendicular to the H_0 field. The respective H_0 fields are arranged in antiparallel directions. A common pumping lamp provides a beam of randomly polarized light at 2537 A. which is plane-polarized into orthogonal beams of light by a Brewster angle polarizer. The orthogonal beams of light are reflected to intersect the absorption cells in each of the spin generators after being circularly polarized by a quarter wave plate. A common readout lamp provides a source of randomly polarized light which is split into a pair of plane-polarized readout beams which respectively intersect the absorption cells of the spin generators. The readout beam passes through the absorption cell so that its



angle of polarization is oscillated by the Faraday effect at the Larmor frequency. The resultant polarization modulated readout beam is converted to an amplitude modulated beam in an analyzer which provides a periodic amplitude varying signal to a photomultiplier detector circuit. The H_1 field generator is in circuit with the photomultiplier for generating the H_1 field for the absorption cell in the associated spin generator. Readout and control circuit means are provided for comparing the phases of the two resonance signals produced by each absorption cell to produce an error signal for driving a motor to control the displacement of a shaft and to provide a control signal to the H_0 field generator to maintain the phase relationships of the respective resonance signals. The angular rotation of the shaft will be proportional to the rotation of the gyroscope about the sensitive axis, parallel to the H_0 direction, with respect to inertial space. One embodiment of the mechanical structure for housing a portion of the gyroscope is also disclosed.

3,778,701

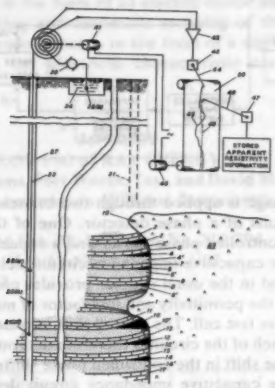
METHOD OF ULTRA LONG SPACED ELECTRIC LOGGING OF A WELL BORE TO DETECT HORIZONTALLY DISPOSED GEOLOGICALLY ANOMALOUS BODIES IN THE VICINITY OF MASSIVE VERTICALLY DISPOSED GEOLOGICALLY ANOMALOUS BODIES LATERAL TO AND NOT INTERCEPTED BY THE WELL BORE

Richard J. Runge, Anaheim, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 22,414, March 25, 1970, abandoned. This application Apr. 21, 1972, Ser. No. 246,289
Int. Cl. G01v 3/18
U.S. Cl. 324—10 **9 Claims**

An electrode array comprising a current source electrode, two potential electrodes and a sink electrode is used in a well

bore to detect horizontally disposed electrically resistive geologically anomalous bodies that are not cut by the well bore when they lie in the vicinity of massive vertically disposed electrically resistive geologically anomalous bodies. Potential detecting electrodes in the array are spaced at nearly equal distances from said current source electrode; one is placed above and one is placed beneath said current source



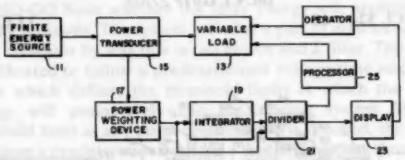
electrode. Resistivity data obtained from said electrode array is compared with short-spaced resistivity data obtained by other means. Differences in the compared data indicate the presence of horizontally disposed electrically resistive geological anomalies lateral to and uncut by the well bore since said electrode array is unresponsive to the presence of the massive vertically disposed electrically resistive geological anomaly.

3,778,702

OPERATING TIME REMAINING COMPUTER

Eugene P. Finger, Brewster, N.Y., assignor to Curtis Instruments, Inc., Mount Kisco, N.Y.

Filed July 13, 1971, Ser. No. 162,148
Int. Cl. G01n *27/42*
U.S. Cl. 324—29.5 **12 Claims**



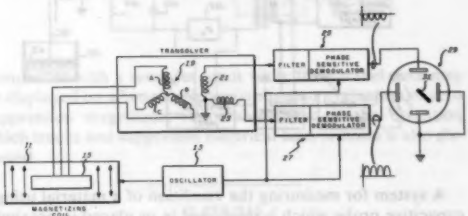
A computer for determining the time remaining at the present rate of energy dissipation before a finite energy source is completely drained of energy. The rate of energy consumption is sensed and then modified by a function generator in accordance with the effect that the rate of energy consumption has on the quantity of energy available from the source. The modified rate of dissipation, i.e., effective rate of energy dissipation, is fed to a coulometer having an output capacitance which is varied in accordance with the integral of the modified signal. The change in the output capacitance is measured by feeding a high frequency interrogation signal to the coulometer. This signal is developed across the output capacitance thereof and accordingly has an envelope which is proportional to the integral of the modified rate of energy dissipation. The developed signal is amplified by an AC amplifier and demodulated by an envelope detector. The demodulated signal is then subtracted from a predetermined value representative of the total rated energy in the system. This resulting value represents the energy remaining in the system. This energy remaining value is then divided by the modified rate of energy dissipation to provide the time remaining at the present rate of energy dissipation.

3,778,703

APPARATUS FOR DETECTING UNLEVELNESS OF A PENDULOUSLY SUPPORTED FLUX VALVE BY SUBJECTING THE VALVE TO A VERTICAL MAGNETIC FIELD

John R. Jackson, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 20, 1971, Ser. No. 209,848
Int. Cl. G01r *33/02*
U.S. Cl. 324—43 R **6 Claims**



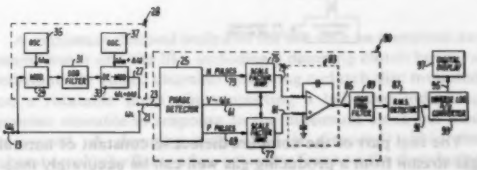
A pendulously mounted flux valve is tested for levelness by applying a vertically oriented alternating magnetic field across the flux valve. The pickup windings on the flux valve are connected to corresponding primary windings in a transolver. The rotor of the transolver is locked in alignment with the flux valve so as to produce quadrature voltages having relative magnitudes representative of any flux valve output voltages with respect to one axis of the valve. The voltages from the transolver are passed through individual signal processors each containing a filter that passes only those signals arising from the applied alternating magnetic field and a phase sensitive demodulator. The demodulator outputs are applied to the deflection plates of a cathode ray tube so as to produce a Lissajou figure consisting of a radial line having a magnitude indicative of the amount by which the plane of the flux valve is inclined with respect to the horizontal and an orientation indicative of the direction of the inclination.

3,778,704

TECHNIQUE FOR DIRECTLY MEASURING A SIGNAL-TO-NOISE RATIO OF A COMMUNICATION CIRCUIT

Andre Lubarsky, Jr., Sunnyvale, and Charles M. Volkland, Los Altos, both of Calif., assignors to Telecommunications Technology, Inc., Sunnyvale, Calif.

Filed Apr. 2, 1973, Ser. No. 346,778
Int. Cl. G01r *27/00*
U.S. Cl. 324—57 R **12 Claims**



A method and apparatus for determining the signal-to-noise characteristic of a communication circuit by first forming a

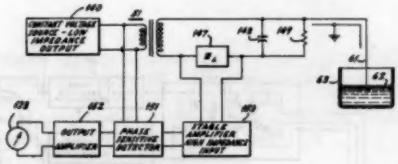
cumulative phase jitter function whose amplitude is proportional to a ratio between magnitudes of a dominant signal and all interfering signals. This phase jitter function is detected by a true r.m.s. detector and a DC output level of the detector is proportional to the signal-to-noise ratio of a communication circuit through which the test signal has been passed.

3,778,705

SUSCEPTANCE MEASURING SYSTEM FOR INDICATING CONDITION OF A MATERIAL

Frederick L. Maltby, Jenkintown, Pa., assignor to Drexelbrook Controls, Inc., Horsham, Pa.

Continuation-in-part of Ser. No. 144,554, May 18, 1971, abandoned. This application May 24, 1971, Ser. No. 146,269
Int. Cl. G01r *27/26*
U.S. Cl. 324—61 R **10 Claims**



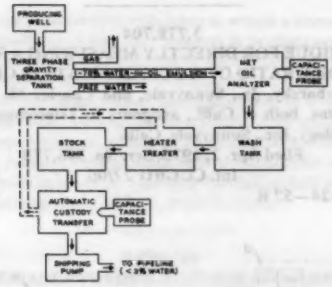
A system for measuring the condition of a material using a capacitive probe which is immersed in or placed in proximity to the material whose condition is to be measured, in which the probe exhibits both susceptive and conductive components, and in which means are provided for producing an indication representative of the susceptive component and substantially independent of the conductive component.

3,778,706

DIELECTRIC CONSTANT MEASUREMENT METHOD

Don D. Thompson, Corona Del Mar, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 50,022, June 26, 1970, Pat. No. 3,675,121. This application July 3, 1972, Ser. No. 268,286
Int. Cl. G01r *27/26*
U.S. Cl. 324—61 R **8 Claims**



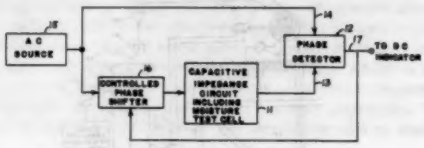
The real part of the complex dielectric constant of natural gas stream from a producing gas well can be accurately measured at the well head by avoiding even minute effects of dispersion and water absorption by driving the capacitance probe at a frequency in a range of 40 to 300 megahertz.

3,778,707

MEANS FOR MEASURING LOSS TANGENT OF MATERIAL FOR DETERMINING MOISTURE CONTENT

Ronald F. Vogel, Bettendorf, Iowa, assignor to Agridustrial Electronics, Inc., Bettendorf, Iowa

Filed Dec. 14, 1972, Ser. No. 315,149
Int. Cl. G01r *27/26*
U.S. Cl. 324—61 R **4 Claims**



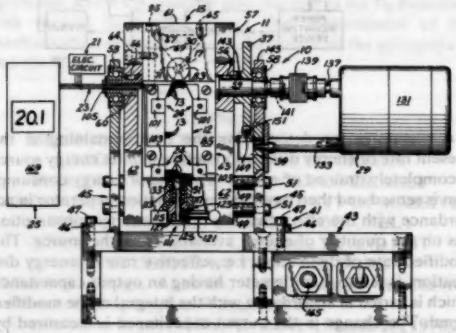
A-c voltage is applied through two branches to respective input circuits of a phase detector. One of the branches includes a controlled phase shifter and a capacitive impedance circuit; the capacitive impedance circuit includes a moisture test cell and in the usual manner provides phase shift dependent upon the permitivity and loss factor of material placed in the moisture test cell. The overall shift in phase of the voltage in this branch of the circuit is therefore determined by the sum of the phase shift in the controlled phase shifter and the phase shift in the capacitive impedance circuit dependent on the sample in the moisture tester. The output of the phase detector is applied to a d-c control circuit of the controlled phase shifter to control the phase shift such that the sum of the phase angles of the phase shifter and the capacitive impedance circuit is maintained at a predetermined constant. The voltage on the output circuit for controlling the phase shifter is also the voltage that is applied to an indicator to determine moisture content according to the loss tangent of the material being tested. The output readings are substantially independent of the densities of the materials placed in the test cell.

3,778,708

METHOD OF AND AN APPARATUS FOR MEASURING AN ELECTRICAL CHARACTERISTIC OF A GRANULAR MATERIAL

Raymond H. Anders, Madison, and Helmut G. Folgmann, Huntsville, both of Ala., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Apr. 30, 1973, Ser. No. 355,847
Int. Cl. G01r *27/02*
U.S. Cl. 324—62 **11 Claims**



A method of and an apparatus for measuring an electrical characteristic of a granular material such as carbon granules

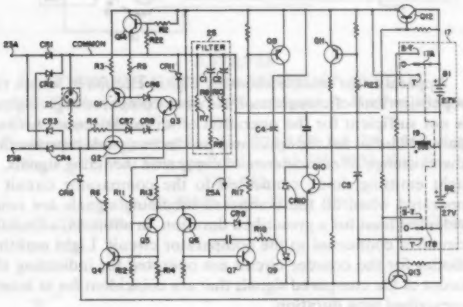
comprises the step of turning a test cell containing the carbon granules to agitate and to pack the carbon granules automatically and uniformly within the test cell for each of a series of measurements of the electrical characteristic. In the preferred method and apparatus, the test cell is filled through an orifice and then a gate for the orifice is closed to enclose a predetermined volume of carbon granules; and means are shifted to provide additional space or volume within the test cell to allow the particles to redistribute and to repack with turning of the test cell. Means in the form of an electric motor and a circuit control the turning and automatic stopping of the test cell movement. A readout means in the form of a digital readout meter provides the electrical characteristic measurement value.

3,778,709

CURRIE FOLLOWING STRAY ENERGY TEST SYSTEM

Robert A. Williams, Fort Worth, Tex., and David M. Holt, Fremont, Calif., assignors to Williams Instruments, Inc., Fort Worth, Tex.

Filed Dec. 22, 1971, Ser. No. 210,794
Int. Cl. G01r *19/16, 31/02*
U.S. Cl. 324—72 **12 Claims**



The specification discloses a system for monitoring stray energy on a breech cap firing circuit on ejector racks, used in military aircraft weapons release systems to indicate on a GO/NO-GO basis whether the stray energy will prematurely fire the weapons. The system includes a pair of inputs coupled to an indicator by way of a series switch and a filter. The filter is calibrated to follow a predetermined voltage-time response curve which defines the threshold limits at which the stray energy will prematurely fire the release system. If the threshold limit at any point on the curve is reached, the filter produces a predetermined output which is sensed by threshold circuitry to actuate the indicator and turn off the series switch.

3,778,710

RANGING AMPLIFIER SYSTEMS

Richard K. Snook, Bridgeton, Mo., assignor to Diginetics Incorporated, Bridgeton, Mo.

Filed Oct. 20, 1971, Ser. No. 190,808
Int. Cl. G01r *1/30, 1/02*
U.S. Cl. 324—123 R **23 Claims**

An auto ranging amplifier with automatic zero suppression which automatically adds a D.C. potential to an amplified input signal to keep a data trace within preestablished channel boundaries. A special circuit integrates the data potential and compares the resultant average with the limits of these preestablished channel boundaries. If the average of the data potential traverses either set point of these preestablished limits, steps of zero suppression are introduced, thus returning the data to the center of the preestablished channel. The equivalent amount of offset is available as an analog step voltage and as a binary number, such as four bits plus sign, in either parallel or serial format. This serial format is directly

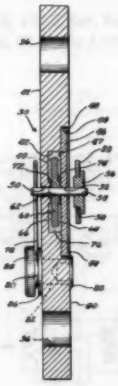
compatible with a recorder input while the parallel data may be displayed on a lamp bank for continuous evaluation of zero suppression magnitude. An embodiment of the invention which tracks and suppresses electrical hum or noise is also disclosed.

3,778,711

DAMPING CLUTCH FOR INDICATING METER

Trevor Samuel, Rochester, Ill., assignor to Sangamo Electric Company, Springfield, Ill.

Continuation of Ser. No. 853,152, Aug. 26, 1969, abandoned.
This application Apr. 14, 1972, Ser. No. 243,979
Int. Cl. G01r *1/14, 19/16*
U.S. Cl. 324—125 **3 Claims**



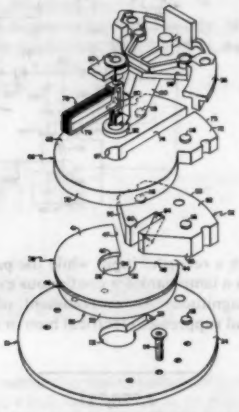
A maximum demand indicator for use with an electrical demand meter and the like including a damping clutch having a substantially closed chamber enclosing a clutch disc mounted on a rotatable pivot pin supporting a balanced indicating pointer movable in response to the maximum electrical load measured. A damping compound is disposed within the chamber which effects a low retarding force on the disc during slow movement of the pointer and effects a substantially greater retarding force on the clutch disc when the pointer is subjected to shock, vibration or other extraneous forces.

3,778,712

LINEAR SCALE MEASURING INSTRUMENT HAVING PREASSEMBLED COIL SUPPORT FRAME

Dennis F. Roerty, Bayonne, and Robert C. MacIndoe, Chatham, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 6, 1972, Ser. No. 269,352
Int. Cl. G01r 1/16
U.S. Cl. 324—151 13 Claims



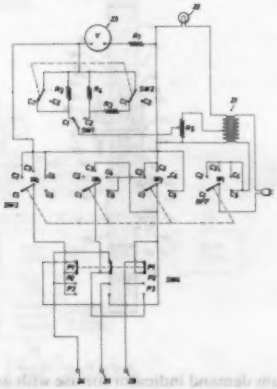
An improved DC electrical measuring instrument which is easily assembled and which has a linear scale.

3,778,713

TRANSISTOR AND DIODE TESTER

Wayne L. Jamison, 3302 Roaming Woods Ln., Spring, Tex.

Filed Apr. 6, 1972, Ser. No. 241,762
Int. Cl. G01r 31/22
U.S. Cl. 324—158 T 6 Claims



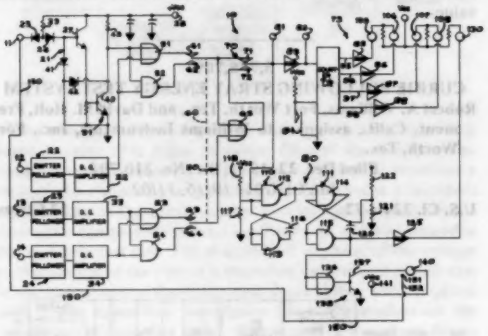
An illustrative embodiment of the invention includes transistor/diode test apparatus employing an A.C. power source. A metering circuit and the device to be tested are placed across the A.C. power source. Switching means for applying the device terminals to the A.C. power source in various configurations while metering the response of the device to the A.C. power is also provided. The test apparatus may be used for either "in circuit" or "out of circuit" component testing.

3,778,714

APPARATUS FOR DETECTING AND COUNTING COINCIDENCE OF INCOMING LOGIC SIGNALS

Norman McHenry, III, 3434 Cunard Ct., San Jose, Calif.

Filed May 30, 1972, Ser. No. 258,132
Int. Cl. G01r 15/12; G04f 9/00
U.S. Cl. 324—181 15 Claims



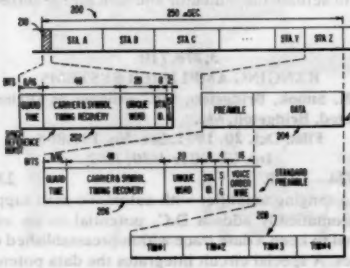
Apparatus for trouble shooting digital circuits in which the repetition rate of coincidence between compared logic signals is not sufficient for the operation of an oscilloscope. A comparator circuit for the apparatus produces signals representing the existence of coincidence of compared incoming signals. A light emitting diode connected to the comparator circuit is operated when all the compared incoming signals are coincident at least for a prescribed duration. In addition, a counter circuit is connected to the comparator circuit. Light emitting diodes for the counter circuit are operated for indicating the count of the compared signals that are coincident for at least a prescribed time duration.

3,778,715

TDMA SATELLITE COMMUNICATIONS SYSTEM WITH RAPID AUTOMATIC RE-ENTRY FOLLOWING BRIEF OUTAGES OF EARTH STATION EQUIPMENT

William G. Schmidt, Rockville; Ova G. Gabbard, Germantown, both of Md.; John M. Husted, Vienna, Va., and Wilfrid G. Maillet, Oxon Hill, Md., assignors to Communication Satellite Corporation, Washington, D.C.

Filed Aug. 11, 1971, Ser. No. 170,930
Int. Cl. H04b 7/20
U.S. Cl. 325—2 5 Claims



In a satellite transponder communications system operating in a time division multiple access mode, each earth station

transmits data in a burst format. All bursts within a single transponder frame are synchronized to a special burst which contains no data communications. A single earth station sends out the reference burst as well as its normal burst and in the case of multi transponders and multi transponder frames, the single reference station sends out all of the reference bursts for the various transponder frames. Data to be transmitted may be received in many different forms and included within the same burst because of the modular arrangement of the earth stations. Individual terrestrial interface modules receive data in various forms, convert the data into bit form which is compatible with the TDMA system, store the converted bit stream and hold the block of data until a multiplexer requests the block of data for inclusion into the earth station's transmitted burst. The arrangement of blocks of data within a burst and the timing and duration of a burst is controlled by digital words stored in a memory. Complete reordering of burst times and the arrangement of blocks of data within a burst is accomplished by changing the words stored in the memory. A comparable system on the receive side of the earth station extracts blocks of data in selected bursts for conveyance to selected terrestrial interface modules. Loss of synchronization at an earth station due to short time transmission interruptions is compensated for by predicting the correct burst transmission time following the end of said interruption.

3,778,716

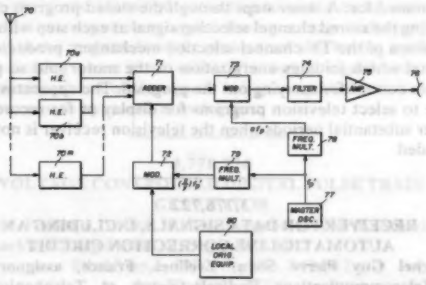
COHERENT CATV TRANSMISSION SYSTEM

Lyle S. Stokes, Hollywood, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation-in-part of Ser. No. 523,653, Jan. 28, 1966, Pat. No. 3,619,782. This application Aug. 25, 1971, Ser. No. 174,742

Int. Cl. H04b *1/68*; H04h *1/00*

U.S. Cl. 325—49 **9 Claims**



A community antenna television system wherein one or more microwave transmission links are used between the CATV receiving unit and the user's receivers. In accordance with the invention, the undesirable effects caused by slight frequency differences between the directly-transmitted television signals and the relayed television signals are eliminated. This is accomplished by providing at the microwave transmitter a pilot signal having a frequency which is an integral submultiple of the microwave carrier frequency. This pilot signal is transmitted, together with the television broadcast signals over the microwave transmission link or links. At the microwave receiver the pilot signal, together with an integral submultiple of the local oscillator, is utilized in a phase-locked loop to synchronize the local oscillator frequency with the microwave carrier frequency.

3,778,717

SOLID-STATE OSCILLATOR HAVING SUCH A STRUCTURE THAT AN OSCILLATING ELEMENT, A RESONATOR AND A RADIATOR OF ELECTROMAGNETIC WAVES ARE UNIFIED IN ONE BODY

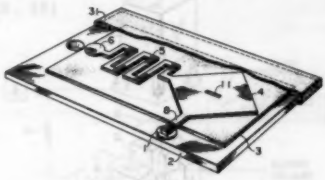
Takanori Okoshi, Tokyo, and Masatoshi Migitaka, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 27, 1972, Ser. No. 248,163

Claims priority, application Japan, Apr. 30, 1971, 46/27975

Int. Cl. H04b *1/04*

U.S. Cl. 325—105 **11 Claims**



A solid-state oscillator for radiating electromagnetic waves in the frequency range from microwave to millimeter wave including solid-state oscillating element, a planar resonator, a high frequency choke, a bias terminal and a substrate which are unified in one body, and including a small slit in the planar resonator for radiating electromagnetic waves.

3,778,718

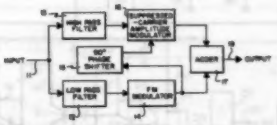
MODULATION SYSTEM

Harland A. Bass, San Jose, and Yves C. Faroudja, Sunnyvale, both of Calif., assignors to Avco Corporation, San Jose, Calif.

Filed Apr. 28, 1972, Ser. No. 248,556

Int. Cl. H03c *5/00*

U.S. Cl. 325—139 **25 Claims**



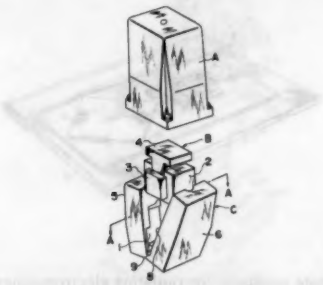
A system for modulating a wideband information signal, in which the information signal is separated into a multiplicity of frequency bands. The several frequency bands are used to modulate a carrier signal in two ways, i.e., frequency modulation and suppressed-carrier amplitude modulation, the modulated signals being added to provide a composite output signal. The composite signal has a maximum number of desirable characteristics and a minimum number of undesirable characteristics, in that the advantages of wide-deviation are partially utilized while the over-all band width is not excessive.

3,778,719

SINGLE BODY PROTECTIVE CASING FOR SOLENOID ASSEMBLY

Haruo Kanawa, Fujisawa, Japan, assignor to Yuken Kogyo Company, Kanagawa-ken, Japan

Filed Dec. 21, 1971, Ser. No. 210,395
Claims priority, application Japan, Dec. 28, 1970, 45/132548
Int. Cl. H01f 7/00
U.S. Cl. 335—278 5 Claims



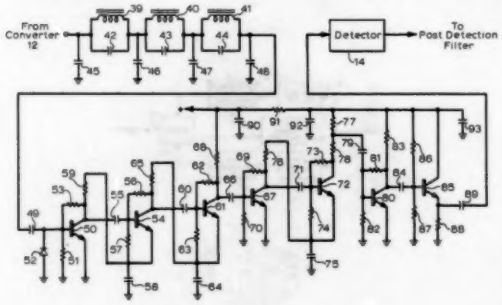
A solenoid assembly of which the electromagentic unit including an electrical coil, a magnetic core, a plunger and so forth are held by a protective casing made from resilient materials and housed in a cover. The protective casing is slit in a desired direction and has an inside space having a corresponding shape to that of the electromagnetic unit.

3,778,720

INTERMEDIATE FREQUENCY AMPLIFIER CIRCUIT

Joseph F. Yello, Wood Dale, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Mar. 8, 1972, Ser. No. 232,881
Int. Cl. H04b 1/24
U.S. Cl. 325—318 2 Claims



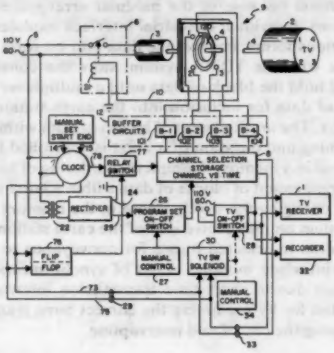
An intermediate-frequency amplifier circuit for an NBFM paging receiver or the like comprises a multi-section resonant filter section, and a multi-stage non-resonant amplifier section. For maximum interstage coupling efficiency, minimum battery drain and maximum portection against strong-signal overload, the five individual amplifier stages of the non-resonant amplifier section are DC powered in series-connected groups of two and three. A limiter is provided for suppressing undesired AM modulation in the received signal and an emitter follower output stage is provided for interfacing with the receiver detector stage.

3,778,721

AUTOMATIC TELEVISION PROGRAMMER

Robert L. Moran, 4 Mackintosh St., Franklin, Mass.

Filed Sept. 8, 1972, Ser. No. 287,557
Int. Cl. H04b 1/06
U.S. Cl. 325—396 12 Claims



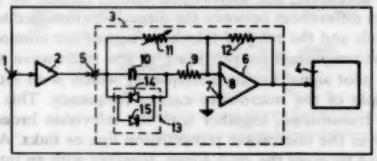
Television channel selection on a TV set is automatically performed according to a stored schedule by a motor which drives the TV set channel selection mechanism, as dictated by a stored schedule of available TV channels versus time. Sets of binary storage elements, each set corresponding to a time interval and each element in a set corresponding to one of the available TV channels are electrically energized to store the schedule. A timer produces sequential time signals at the initiation of each scheduled TV program. Each time signal initiates an output from one of the elements of the set of elements that corresponds to the time interval, represented by the time signal, and so the output from a particular binary storage element, called a channel selection signal, represents the given TV channel and the time interval that channel is programmed for. A timer steps through the stored program comparing the stored channel selection signal at each step with the position of the TV channel selection mechanism, producing a signal which initiates energization of the motor and so provides control for carrying out the program. The apparatus has use to select television programs for display or for recording over substantial periods when the television receiver is not attended.

3,778,722

RECEIVER FOR DATA SIGNALS, INCLUDING AN AUTOMATIC LINE CORRECTION CIRCUIT

Michel Guy Pierre Stein, Yvelines, France, assignor to Telecommunications Radioelectriques et Telephoniques, Paris, France

Filed May 11, 1972, Ser. No. 252,362
Claims priority, application France, May 24, 1971, 7118643
Int. Cl. H04l 27/08
U.S. Cl. 325—414 4 Claims



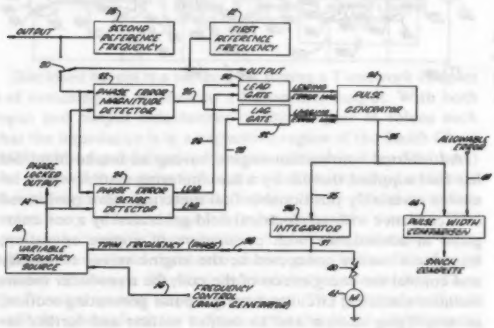
A receiver in a system for baseband data transmission includes a correction circuit for correcting the distortions

caused by a transmission line. The correction circuit is provided with a number of correction cells constituted by active highpass filters. An automatic adaptation of the correction circuit to the slope of the line is obtained with the aid of a circuit element having a non-linear current-voltage characteristic without using a separate control circuit.

3,778,723
ZERO DEGREE PHASE COMPARATOR

Daniel F. Schaefer, Inglewood, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 28, 1972, Ser. No. 229,867
Int. Cl. H03b *3/04*
U.S. Cl. 328—133 **21 Claims**

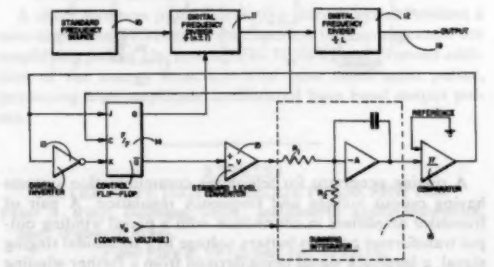


A variable frequency three-phase square wave signal is synchronized to a three-phase reference frequency signal at a substantially zero degree phase relation. Synchronization is accomplished in but a few cycles by comparing each component of the two signals to be compared and also comparing both positive and negative going half cycles of each component. Six phase error magnitude pulses are generated for each cycle and identified according to phase error sense to provide an output error signal having a magnitude proportional to the magnitude of the phase error and having a polarity indicating phase error sense. The output signal trims the frequency of one of the signals being compared to cause the phase error to approach zero degrees.

3,778,724
VOLTAGE CONTROLLED DIGITAL PULSE TRAIN GENERATOR

David Perlman, Irvine, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed May 1, 1972, Ser. No. 249,012
Int. Cl. H03k *17/00*
U.S. Cl. 328—150 **7 Claims**

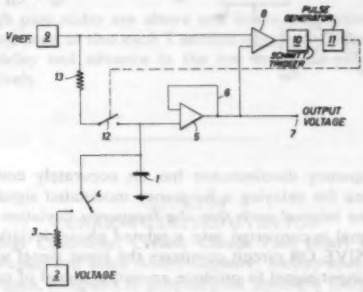


A precision voltage controlled digital pulse train generator wherein a summing integrator is used to keep the average count of a digital divider at a value such that the average frequency deviation from a nominal frequency f_n corresponding to a count of N is proportional to a control voltage input.

3,778,725
NON-DRIFTING HOLD-AMPLIFIER

Klaas Spaargaren, and Jan Snoeks, both of Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Filed July 6, 1972, Ser. No. 269,369
Claims priority, application Netherlands, July 6, 1971, 7109293
Int. Cl. H03b *3/02*
U.S. Cl. 328—151 **3 Claims**

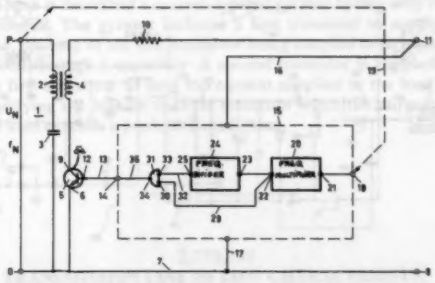


A method and apparatus for controlling a process wherein a hold amplifier is used to maintain the charge on a capacitor, the charge on the capacitor representing the desired position of a control element. The charge on the capacitor is maintained by periodically connecting it to a reference voltage.

3,778,726
METHOD OF AND APPARATUS FOR GENERATING SIGNALS

Jaromir Kucera, Hegnau, Switzerland, assignor to Zellweger AG, Uster, Switzerland

Filed June 2, 1972, Ser. No. 259,199
Claims priority, application Switzerland, July 1, 1971, 8913/71
Int. Cl. H03k *3/02*
U.S. Cl. 328—223 **10 Claims**



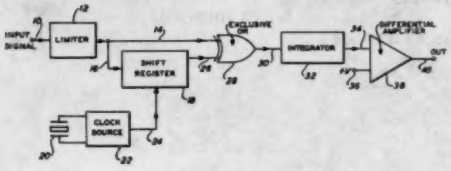
A method of and apparatus for generating in a power supply system a transmission signal with a frequency bearing a fixed relationship to the mains frequency of the power supply system. An impulse sequence whose repetition frequency bears the aforementioned fixed relationship to the mains frequency is formed by frequency multiplication and frequency division. A tank circuit connected to the power supply system and tuned at least approximately to the said repetition frequency is excited by it into oscillation in each cycle of the impulse sequence.

3,778,727

CRYSTAL CONTROLLED FREQUENCY DISCRIMINATOR

Arthur B. Williams, Smithtown, N.Y., assignor to The Singer Company, Little Falls, N.J.

Filed May 11, 1972, Ser. No. 252,369
Int. Cl. H04l 27/14
U.S. Cl. 329—104 6 Claims



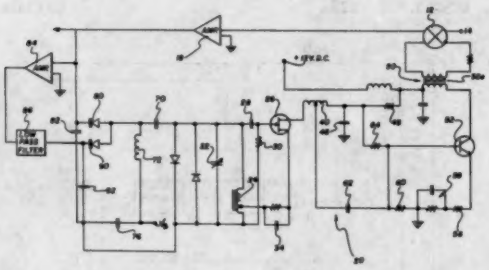
A frequency discriminator has an accurately controlled delay time for delaying a frequency modulated signal for a fixed time interval such that the frequency deviation of the input signal is converted into a related phase deviation. An EXCLUSIVE OR circuit compares the input signal with the delayed input signal to produce an output signal of constant amplitude and duration pulses having a pulse repetition rate double that of the carrier frequency of the input signal. The fixed delay is provided by a multistage shift register that is clocked by a crystal controlled oscillator.

3,778,728

PHASELOCKED-FM DETECTOR APPARATUS

Raymond W. Nupp, Rochester, N.Y., assignor to EDMAC Associates Inc., Rochester, N.Y.

Filed Apr. 11, 1972, Ser. No. 242,940
Int. Cl. H03d 3/24
U.S. Cl. 329—110 2 Claims



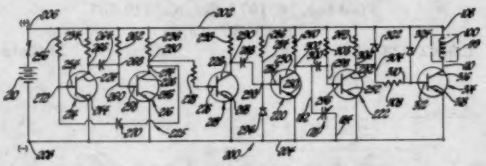
A phaselock loop FM detector for detecting an incoming FM signal includes a voltage controlled oscillator (VCO) which produces an output signal and two control circuits, the first of which includes a varactor and causes the oscillator output signal to be at the center frequency of the incoming signal, and the second control circuit includes a second varactor and causes the oscillator output signal to lock on the modulation of the input signal.

3,778,729

VARIABLE CAPACITANCE CONTROLLED TRANSISTOR MULTIVIBRATOR PULSE GENERATOR FOR ENGINE FUEL METERING SYSTEM

Michael F. Ciemochowski, Warren, Mich., assignor to Colt Industries Operating Corp., New York, N.Y.

Filed Dec. 20, 1971, Ser. No. 209,539
Int. Cl. F02m 51/00; H03b 3/04
U.S. Cl. 331—65 1 Claim



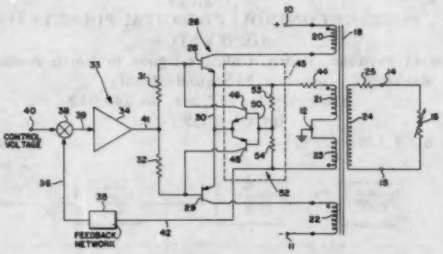
An internal combustion engine having an intake manifold has fuel supplied thereto by a fuel metering system which includes a variably positionable fuel metering valve positioned in accordance with an electrical field generated by a coil energized in accordance with parameters of engine operation; transducer means connected to the engine serves to modify and control the energization of the coil; the transducer means includes electrical circuitry having a pulse generating section, an amplifying section and an output section and further includes a pressure responsive member responsive to the pressure within the intake manifold and effective for varying the value of variable capacitance means which in turn modulates the circuit constants of the electrical circuitry in a way as to cause a corresponding variable output of the output section.

3,778,730

LOW HARMONIC TELEPHONE RINGING GENERATOR

Gordon W. Cromwell, and Walter G. Borland, both of Waterford, Pa., assignors to Elgin Electronics, Inc., Waterford, Pa.

Filed Nov. 18, 1971, Ser. No. 199,885
Int. Cl. H03b 3/02, 5/26
U.S. Cl. 331—109 18 Claims



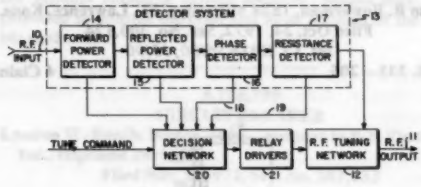
A ringing generator for telephone communication systems having output voltage and frequency regulation. A pair of transistor amplifiers in connection with a plural winding output transformer convert battery voltage to a sinusoidal ringing signal, a feedback signal being derived from a further winding of the output transformer providing output voltage regulation. A further pair of transistors provide variable shunting of the signal applied to the transistor amplifiers for current limiting control.

3,778,731

TUNING METHOD FOR T-NETWORK COUPLERS

Johannes A. F. Oomen, Rotterdam, Netherlands, assignor to Cincinnati Electronics Corporation, Evandale, Ohio

Filed June 5, 1972, Ser. No. 259,427
Int. Cl. H03h 7/40
U.S. Cl. 333—17 7 Claims



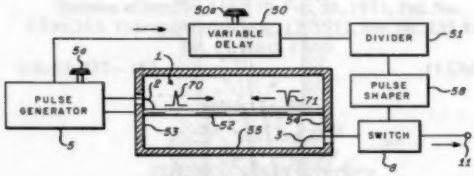
Disclosed herein is a method for tuning a T-network coupler and matching an antenna to a transmitter output. With both input and output inductances of the coupler at values such that the impedance is in a capacitive region of the Smith Chart and within a predetermined resistance circle (say 50 ohms) the value of the output inductance is first increased until said resistance circle is traversed (moving in the direction of less resistance), as sensed by a loading or resistance detector. The input inductance is then increased until the resistance value again traverses said resistance circle, going in the direction of greater resistance. The resistance detector senses this. Then the first and second steps are repeated. The process continues until the phase detector indicates that the phase angle is zero. In any case wherein the impedance is in an inductive region the output inductance is decreased only when the resistance is less than that of the load (50 ohms, for example) and the input inductance is decreased only if the resistance is greater than that of the load.

3,778,732

BASE BAND PULSE ENERGY STORAGE SYSTEM

Chao Chen Wang, West Concord, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 20, 1972, Ser. No. 308,081
Int. Cl. H03k 5/01
U.S. Cl. 333—20 14 Claims



A short duration pulse circulating storage system utilizes a non-dispersive TEM-mode transmission line arrangement for amplifying pulsed electromagnetic fields by synchronous addition of the energy from low-level base band input pulses, producing high-amplitude undistorted base band output pulses.

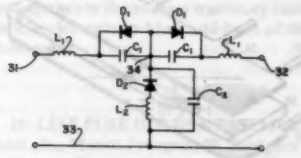
3,778,733

FILTER-TYPE DIGITAL DIODE PHASE SHIFTER

Peter A. Rizzi, Dedham, Mass., assignor to Alpha Industries, Inc., Woburn, Mass.

Filed May 8, 1972, Ser. No. 251,116
Int. Cl. H01p 1/18
U.S. Cl. 333—31 R 1 Claim

Three PIN diodes form a T junction. When the series diodes are forward biased, the shunt diode is reverse-biased to effectively form a low pass circuit. When the series diodes are reverse-biased, the shunt diodes are forward-biased to form effectively a high pass circuit. The cut off frequency of the low and high pass states are above and below, respectively, the operating band so that each T section selectively introduces a phase delay and advance in the low and high pass states, respectively.

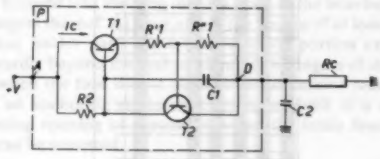


3,778,734

CURRENT-LIMITED GYRATOR

Joel Serge Colardelle, Creteil; Claude Paul Henri Lerouge, Maurepas, and Marc Andre Regbuer, Aulnay-sous-bois, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 2, 1972, Ser. No. 277,429
Int. Cl. H03h 11/00, 7/44
U.S. Cl. 333—80 T 1 Claim



There is described a current-limited gyrator having only two terminals. The gyrator includes a first transistor to supply a load, the base of the first transistor being coupled to its emitter circuit through a capacitor. A second transistor is coupled to the first transistor to limit the current supplied to the load by modifying the bias of the first transistor when the current to the load exceeds a predetermined value.

3,778,735

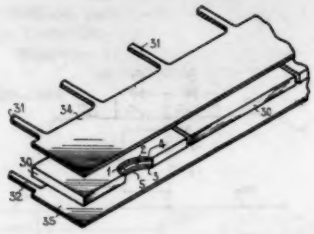
TRANSMISSION LINE OF LOW CHARACTERISTIC IMPEDANCE

Jean Louis Steenmetser, Paris, France, assignor to LCC CICE-Compagnie Europeenne des Composants Electroniques, Paris, France

Filed May 4, 1972, Ser. No. 250,245
Claims priority, application France, May 25, 1971, 7118870
Int. Cl. H01p 3/00, 3/08
U.S. Cl. 333—84 M 8 Claims

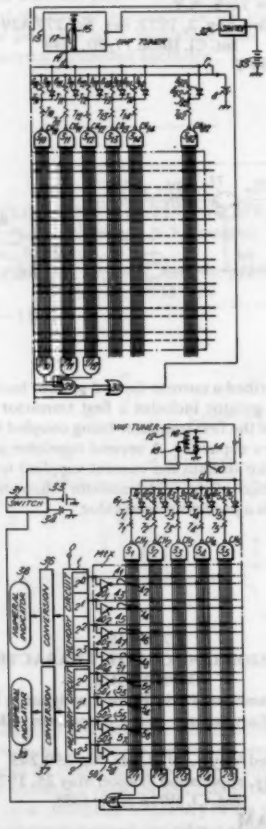
A transmission line for electrical signals of very low characteristic impedance, produced from a strip of chemically

reduced ceramic in order to create a low-resistivity medium, then reaoxidized at the surface in order to produce two films of



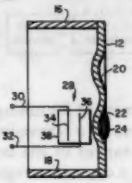
high dielectric constant, covered with metallized coatings on the dielectric films, and fitted with distribution connections soldered to these coatings for the signals.

3,778,736
CHANNEL SELECTION SYSTEM
Yoichi Sakamoto, Toyonaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Sept. 13, 1971, Ser. No. 179,860
Claims priority, application Japan, Sept. 12, 1970, 45/80273; Sept. 12, 1970, 45/80274; Sept. 12, 1970, 45/80275; Sept. 12, 1970, 45/80276
Int. Cl. H03j *5/04*
U.S. Cl. 334—15 **9 Claims**



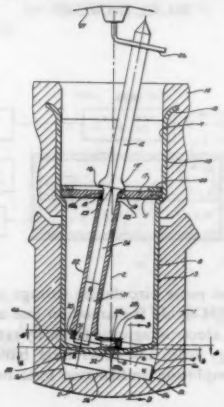
A pair of memory circuits, each comprising four binary memory units, are connected to a matrix network for applying binary coded digital outputs of the memory circuits to a set of logic gates, for instance NAND-gates, which, in response to said output signals of the memory circuits, connect a selected voltage-feeding network to variable-capacitance diodes of selected tuning circuits.

3,778,737
MAGNETIC CHIP SWITCH
William R. Bowerman, 1824 Mississippi St., Lawrence, Kans.
Filed Oct. 24, 1972, Ser. No. 300,124
Int. Cl. H01h *36/00, 15/00*
U.S. Cl. 335—205 **4 Claims**



A switch box is provided with a magnetically attractive face plate formed with two or more spaced indents. Within the box and adjacent only one of the indents is a magnetically responsive switch. A small magnetic button conforming to the shape of the indent is normally stored within the indent away from the switch and is held in place by magnetic attraction. When the switch is to be actuated, the magnetic button is moved from the storage indent to the indent adjacent the switch. This will open or close the switch depending upon its normal state.

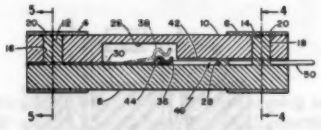
3,778,738
NUTATABLE SHAFT AND A ROTATABLE MEMBER WITH A MAGNETIC COUPLING THEREBETWEEN
William Grant Pontis, 303 Wendy Ln., Waverly, Ohio
Filed Oct. 25, 1972, Ser. No. 300,845
Int. Cl. H01f *7/02*
U.S. Cl. 335—306 **17 Claims**



A shaft mounted for nutation, a rotatable member rotatable about an axis passing through the apex point of nutation of the shaft and a magnetic coupling between the shaft and the rotatable member. A driven magnet is provided in association with the shaft and is capable of nutation therewith. A driving magnet is mounted on a primary rotatable driving member, and is rotatable therewith. Means are provided separating the driven and driving magnets. The driving and driven magnets are so oriented with respect to each other as to form a non-

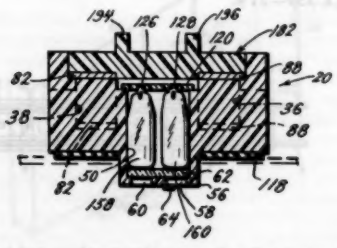
contacting magnetic coupling therebetween whereby rotation of the primary rotatable driving member and the driving magnet mounted thereon will result in nutation of the shaft and the driven magnet in association therewith. The shaft and its associated driven magnet may be located in a different medium or environment from the primary rotatable driving member and its driving magnet. Furthermore, the driving magnet may be protected from the medium or environment surrounding the primary rotatable driving member. Means may also be provided to control the orbit and axial rotation of the nutatable shaft.

3,778,739
CIRCUIT BREAKER
Lyndon W. Burch, Boston, Mass., assignor to B/K Electric Co., Inc., Highland Park, Ill.
Filed Nov. 2, 1972, Ser. No. 303,033
Int. Cl. H01h *71/16, 71/50*
U.S. Cl. 337—72 **15 Claims**



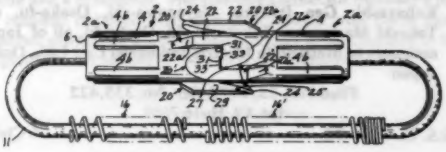
A cartridge-type thermostatically operated, manually resettable circuit breaker having a strip of thermostat metal which flexes when heated by the passage of current therethrough to release a V-shaped spring member having divergent arms. The latter, when engaged by the thermostat member, is held in a position such that the arms are forced toward each other, and when the spring member is released, the resilience of the arms urges the member away from the thermostat member. The circuit connections are made to the thermostat member, and to the spring-shaped member, and separation of the thermostat member and the spring member breaks the circuit, the thermostat member and the spring wire member each constituting the only contacts in the device.

3,778,740
PROTECTORS FOR ELECTRIC CIRCUITS
Aldino J. Gaia, and Angelo Urani, both of St. Louis, Mo., assignors to McGraw-Edison Company, Elgin, Ill.
Division of Ser. No. 116,819, Feb. 19, 1971, Pat. No. 3,739,313. This application Mar. 17, 1972, Ser. No. 235,810
Int. Cl. H01h *85/02*
U.S. Cl. 337—187 **11 Claims**



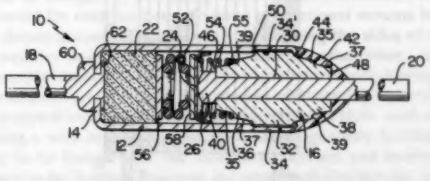
An electric fuse has a cup-like housing that is subdivided into two separate compartments by a partition; and each compartment has a fusible element therein which is embedded within arc-extinguishing material. A portion of the partition projects beyond the cup-like housing to enter a slot in a fuseholder to automatically align the terminals of the electric fuse with the fuse-receiving terminals of the fuseholder. An indicating lamp is connected in parallel with one of the fusible elements, and a second indicating lamp is connected in parallel with the other fusible element; and the conductors which connect those indicating lamps to the load terminals of the fuseholder are spaced far enough apart to prevent "arc over" but are close enough to each other to capacitively couple those lamps together in the event a transitory fault causes both of those fusible elements to blow and both of those lamps to become illuminated.

3,778,741
IN-LINE FUSE HOLDER ASSEMBLY
John Schmidt, Jr., Mount Prospect, Ill., assignor to Littelfuse, Inc., Des Plaines, Ill.
Filed Feb. 24, 1972, Ser. No. 228,888
Int. Cl. H01h *85/02*
U.S. Cl. 337—201 **12 Claims**



An in-line fuse holder assembly comprising a pair of hollow fuse holder parts having confronting open ends held in abutment by circumferentially spaced axially extending interlocking fingers at the confronting open ends of the fuse holder parts. The fingers have tapering outer ends so the confronting circumferentially facing edges of adjacent fingers of each fuse holder part define a flaring mouth or entryway for the fingers of the other fuse holder part when the fuse holder parts are separated and positioned so the fingers are out of alignment, to permit the open inner ends of the fuse holder parts readily to be brought into abutting relation prior to the interlocking of the fingers thereof. At least one of the fingers of at least one of the fuse holder parts has a narrow shank portion extending rearwardly beyond the end portions of the fingers of the other part when the fuse holder parts are in assembled relation, to form an anchoring rib insertable into a notch in a circular mounting opening of a panel in which the latter fuse holder part can be mounted.

3,778,742
ELECTRICAL SWITCH CONSTRUCTION AND END PLUG THEREFOR OR THE LIKE
Phillip Edward Merrill, Kettering, Ohio, assignor to Micro Devices Corp., Dayton, Ohio
Filed July 16, 1971, Ser. No. 163,170
Int. Cl. H01h *37/76*
U.S. Cl. 337—407 **12 Claims**



An end plug for a switch construction, the plug having two identical inward and outward extensions extending from a large central portion so as to be usable in a like manner regardless of which extension is the inward or outward thereof in its assembled relation with the switch casing whereby the inward extension is adapted to provide a locating means for a

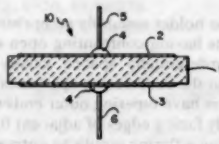
spring inside the switch casing and the outward extension is adapted to provide means for spacing an exposed part of one of the switch conductors from the casing a predetermined distance. Each of the extensions of the plug has an axial length at least substantially the same as the axial length of the central portion thereof. Each of the extensions of the plug of one embodiment has a locating means intermediate its ends whereby the locating means on the inward extension is adapted to provide locating means for positioning one end of the internal spring in the switch casing and the locating means on the outward extension is adapted to provide means for mechanically locking an adhesive thereto that secures the casing to the exposed portion of the conductor whereas in another embodiment each of the extensions of the plug has a smooth frustoconical configuration.

3,778,743

VOLTAGE-NONLINEAR RESISTORS

Michio Matsuoka, Hirakata-shi, Osaka-fu; Yoskikazu Kobayashi; Gen Itakura, Neyagawa-shi, Osaka-fu, and Takeshi Masuyama, Takatsuki-shi, Osaka-fu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 23, 1973, Ser. No. 335,422
Int. Cl. H01c 7/10
U.S. Cl. 338—20 **6 Claims**



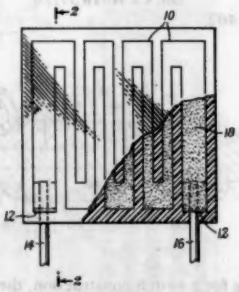
A voltage-nonlinear resistor has a sintered body of a composition comprising as a main constituent, zinc oxide (ZnO) and, as an additive, 0.1 to 3.0 mole percent of bismuth oxide (Bi_2O_3), 0.05 to 3.0 mole percent of antimony oxide (Sb_2O_3) and 0.1 to 3.0 mole percent of chromium fluoride (CrF_3). Electrodes are applied to opposite surfaces of the sintered body.

3,778,744

FILM RESISTORS

Henry W. Brandi, P.O. Box 4 - 2085 R, Morristown, N.J.

Filed Feb. 28, 1973, Ser. No. 336,518
Int. Cl. H01c 1/14
U.S. Cl. 338—260 **7 Claims**



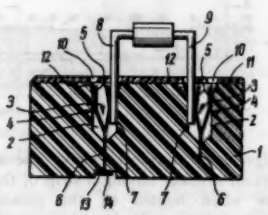
A metal film resistor adapted to be combined with like resistors to form a resistor network. The film is deposited on a dielectric as a nickel-chrome alloy being fused thereto as by means of a glass medium. Leads are connected to the back or front sides of the resistor by means of silverized terminals which are fused to the dielectric on two sides and the intervening edge of its dielectric thereby affording such option and allowing the film to be deposited over the entire surface of its front side when the leads are connected on the back side. The resistance path is formed in the film between slots cut through both the deposited film and the dielectric whereby the resistance of the film may be adjusted extremely accurately to the desired ohmage.

3,778,745

CIRCUIT BOARD AND METHOD OF MAKING THE SAME

Arthur Fischer, Altheimer Strasse 219, D–7241, Tumlingen, Germany

Filed Aug. 18, 1971, Ser. No. 172,725
Claims priority, application Germany, Aug. 27, 1970, P 20 42 423.1
Int. Cl. H01r 11/20, 29/00, 31/08
U.S. Cl. 339—18 C **9 Claims**



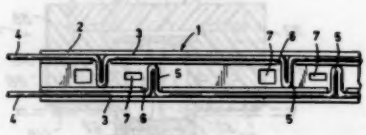
A member of electrically insulating material is provided with a plurality of recesses each of which is bounded by an interior surface. Electrically conductive contact assemblies are anchored in the material of the member and each have several resiliently deflectable clamping portions which bear against or towards the interior surface of one of the recesses, being connected by a base portion both mechanically and electrically with the base portion being embedded in the material of the member.

3,778,746

CONTACT RAIL UNIT

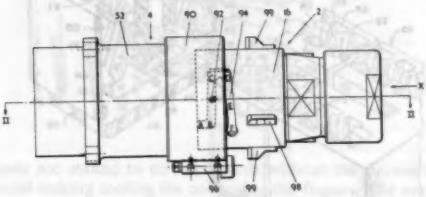
Rainer Ilkka Tapio Valtonen, Soukka, Finland, assignor to Oy Nokia Ab, Helsinki, Finland

Filed Jan. 31, 1972, Ser. No. 221,929
Claims priority, application Finland, Feb. 2, 1971, 281/71
Int. Cl. H01r 9/00
U.S. Cl. 339—21 R **12 Claims**



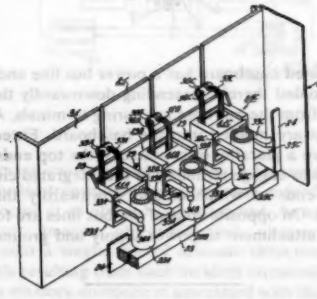
A contact rail unit comprising an elongated body and conductors arranged longitudinally within the body. The conductors are provided with mutually spaced lateral branches and the body is provided with openings for each branch, each opening being displaced in the longitudinal direction of the body with respect to the corresponding branch. The contact fingers of a current collecting devize may be inserted through said openings and brought in contact with said branches by a sliding movement in the longitudinal direction of the body.

3,778,747
ELECTRICAL CONNECTOR
Simo Curcic, Derby, England, assignor to Coal Industry (Patents) Limited, London, England
Filed Apr. 13, 1971, Ser. No. 133,622
Claims priority, application Great Britain, Apr. 28, 1970, 20,283/70
Int. Cl. H01r 13/62
U.S. Cl. 339—45 M 10 Claims



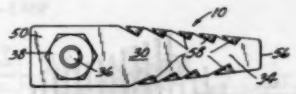
An electrical connector which has mating plug and socket parts which can be joined together by connecting means without causing relative rotation of the parts. Each part comprises main and auxiliary contacts and the connecting means includes a cam profile and cam follower which ensure that the auxiliary contacts of the two parts make after the main contacts make on assembly of the connector and break before the main contacts break on disassembly of the connector.

3,778,748
STAB CONNECTOR
Burdette M. Holman, Brookfield, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed May 5, 1972, Ser. No. 250,572
Int. Cl. H01r 13/62
U.S. Cl. 339—64 M 8 Claims



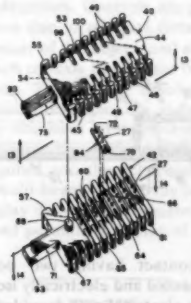
A stab connector comprising an insulated body portion with a convenient quick insert which carries a pair or a double pair of contacts. Biasing means within the insert operate on the contacts to resist forces which tend to move the contacts away from each other and as a result ensures positive electrical engagement of the contacts with the buses.

3,778,749
CONNECTOR
Henry K. Kapell, Mahtomedi, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Nov. 2, 1971, Ser. No. 194,879
Int. Cl. H01r 9/06; H02g 15/08
U.S. Cl. 339—97 R 4 Claims



A connector for making electrical connection between an externally jacketed conductive shield on a communication cable and a conductor. The vise-like connector includes a pair of resilient opposed plate-like jaws formed with barbs along tapered projecting portions and adapted to be clamped in engagement with an end of the externally jacketed shield.

3,778,750
WIRE TERMINATION AND SPLICING SYSTEM
Jack Edward Caveney, Chicago; Roy Alleyne Moody, Flossmoor, and John Jean Bulanda, New Lenox, all of Ill., assignors to Panduit Corp., Tinley Park, Ill.
Filed Feb. 10, 1972, Ser. No. 225,089
Int. Cl. H01r 9/08
U.S. Cl. 339—97 R 9 Claims



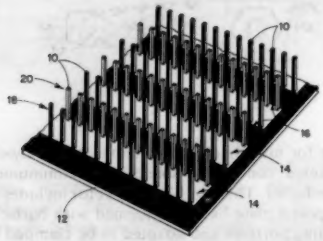
A wire termination and splicing system including a frame having a pair of upstanding frame members upon which two series of elongated, two-sided, multi-contact, connectors are mounted for rotation between pairs of rotational mounts having detent action for successively positioning the sides of the connectors in convenient wire installation orientation; each connector including an insulative connector block having a plurality of wire-receiving slots therein and carrying a plurality of recessed insulation-stripping contacts in the slots, each slot having a wire restraining structure for temporarily holding a wire to be forced onto the associated contact and retaining structure for holding a wire on the associated contact; the connector block being provided with a color coding adjacent to the slots, reaction surfaces for cooperating with a wire installation tool, and a cap for assisting in holding installed wires therein; wire guiding channels are provided, associated with the frame for bringing wires from cables to the connectors and for guiding cross-connect wires between the two series of connectors.

3,778,751

APPARATUS FOR PROVIDING IMPROVED IDENTIFICATION OF ELECTRICAL TERMINALS

John A. Walsh, Acton, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 23, 1971, Ser. No. 211,521
Int. Cl. H01r *3/00*
U.S. Cl. 339—113 B **13 Claims**



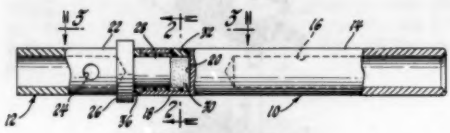
An electrical terminal field overlay having alternate light and dark background areas to alternately reflect light from and to silhouette the terminals to make them more distinguishable.

3,778,752

CONNECTOR CONTACT INCLUDING AN ISOLATION RESISTOR

LeRoy W. Noyes, Milwaukee, Wis., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 26, 1971, Ser. No. 202,320
Int. Cl. H01r *11/08*
U.S. Cl. 339—147 R **1 Claim**



A connector contact having two portions which are mechanically connected and electrically isolated one from the other except for an electrical path provided through a resistor which acts as a buffer between an active circuit connected to one portion and a testing device connected to the other portion.

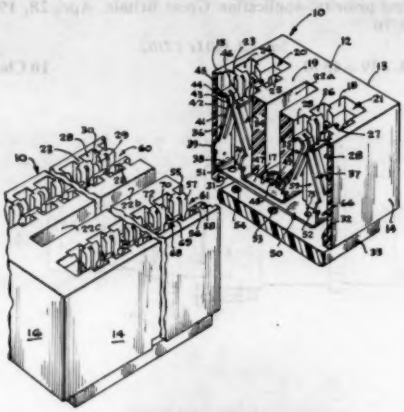
3,778,753

ELECTRICAL CONNECTOR

Carl Occhipinti, Melrose Park, and Irvin Richard Triner, Stickney, both of Ill., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed May 5, 1972, Ser. No. 250,547
Int. Cl. H05k *1/07*
U.S. Cl. 339—156 R **9 Claims**

An electrical connector for flat circuit bearing elements such as printed circuit boards as provided and includes an insulating housing with exterior surfaces including front and rear faces and a pair of elongated channels extending from the front face rearwardly into the housing for receiving the printed circuit boards, the rear face of the housing including a plurality of apertures extending into the housing for electrical access to the interior of the housing, and a plurality of metallic contacts including active portions spaced along and extending into the channels for engagement with conductive elements on the printed circuit boards and bridging portions interconnecting pairs of active portions in the housing, with at least one bridging portion overlying a second bridging portion with respect to the rear face and including an aperture aligned with one of the apertures from the rear face to provide electrical access to the underlying bridging portion.

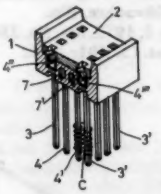


3,778,754

SOCKET FOR INTEGRATED CIRCUIT

Toru Takahashi, and Kohei Kaneko, both of Yokohama, Japan, assignors to Yamaichi Denki Kogyo, K. K. (Yamaichi Electric Mfg. Co. Ltd.), Tokyo, Japan

Filed Dec. 8, 1971, Ser. No. 205,867
Claims priority, application Japan, June 26, 1971, 46/55455
Int. Cl. H01r *13/50*
U.S. Cl. 339—176 M **5 Claims**



An insulated baseboard has a power bus line and a ground bus line molded therein. Extending downwardly through the baseboard from the bus lines are wiring terminals. A plurality of openings are molded into the baseboard. Fitted into the openings are a plurality of contactors, the top ends of which have means to engage terminals of the integrated circuits, and the lower ends of which extend downwardly through the baseboards. On opposite ends of the bus lines are formed terminals for attachment to power supply and ground conductors.

3,778,755

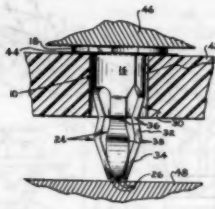
SELF-STAKING WIRE GRIP TERMINAL

Richard L. Marks, Mechanicsburg, Pa., assignor to Berg Electronics, Inc., New Cumberland, Pa.

Filed Nov. 6, 1972, Ser. No. 304,090
Int. Cl. H01r *9/08*
U.S. Cl. 339—220 R **6 Claims**

A wire grip circuit board terminal having a cylindrical body, a circumferential flange on one end and collapsable fingers on

the other end. The collapsable fingers permit staking of the terminals to circuit boards of different thicknesses. The ter-



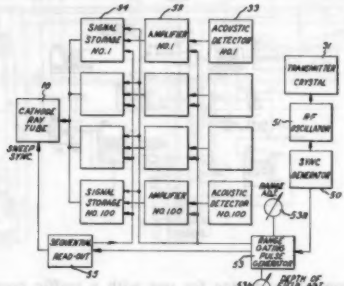
minals are staked to circuit boards without the necessity of special staking tooling for collapsing the fingers. The ends of the fingers grip wires inserted into the terminals.

3,778,756

METHOD AND APPARATUS FOR VISUAL IMAGING OF ULTRASONIC ECHO SIGNALS UTILIZING A SINGLE TRANSMITTER

John M. Houston, and Jack D. Kingsley, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 1, 1972, Ser. No. 285,910
Int. Cl. G01s 9/66
U.S. Cl. 340—5 MP **28 Claims**



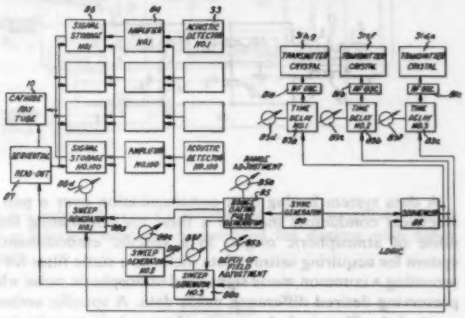
Visual image conversion of ultrasonic echo signals utilizes a single acoustic transmitter for generating pulsed ultrasonic signals directed at an object being examined. An acoustic lens or reflector images object-reflected ultrasonic signals (echoes) onto a single row of acoustic detectors and such echo signals resulting from each incident ultrasonic signal are stored in a memory component associated with the detectors. The memory is subsequently read out sequentially for visually displaying the ultrasonic echo signals stored in the memory component on a line-by-line basis on a conventional cathode ray tube or other serial input visual display device. Alternatively, no memory is required and the echo signals are displayed more rapidly on a multi-beam cathode ray tube or other parallel input visual display device. The sequence can be repeated many times a second permitting display of motion of the object.

3,778,757

METHOD AND APPARATUS FOR VISUAL IMAGING ULTRASONIC ECHO SIGNALS UTILIZING MULTIPLE TRANSMITTERS FOR REDUCED SPECULAR REFLECTION EFFECTS

John M. Houston, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 1, 1972, Ser. No. 285,913
Int. Cl. G01s 9/66
U.S. Cl. 340—5 MP **39 Claims**



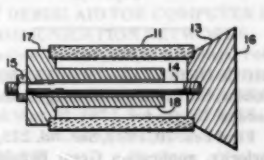
Visual image conversion of ultrasonic echo signals utilizes a plurality of acoustic transmitters oriented at different angles about an object being examined for reducing the effects of specular reflection. The transmitters are separately pulsed for sequentially generating ultrasonic signals directed at the object. An acoustic lens or reflector images object-reflected ultrasonic signals (echoes) onto a single row of acoustic detectors associated with the centrally-most oriented transmitter and such echo signals resulting from each sequentially incident ultrasonic signal are stored in a memory component associated with the detectors. Controls are provided for echo timing compensation due to unequal distances between the transmitters and center of the object, and also due to the particular angles of each off-axis transmitter from the centerline axis of the apparatus. The memory is subsequently read out sequentially for visually displaying the stored ultrasonic echo signals on a line-by-line basis on a conventional cathode ray tube or other serial input visual display device. Alternatively, no memory is required and the echo signals are displayed more rapidly on a multi-beam cathode ray tube or other parallel input visual display device. The sequence can be repeated many times a second permitting display of motion of the object.

3,778,758

TRANSDUCER

David L. Carson, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 25, 1972, Ser. No. 292,045
Int. Cl. H04b 13/00
U.S. Cl. 340—10 **12 Claims**



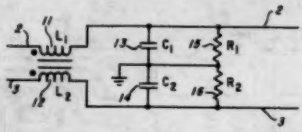
A high energy level acoustic transducer employs a reentrant tail mass structure. Dimensions and placement of the reentrant portion of the tail piece eliminate lateral or rocking vibration modes of the transducer in the operative bandpass.

3,778,759

STATIC FILTER FOR LONG LINE DATA SYSTEMS

Paul E. Carroll, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 27, 1971, Ser. No. 212,606
Int. Cl. H04b 3/28; G01v 1/22
U.S. Cl. 340—15.5 F 9 Claims



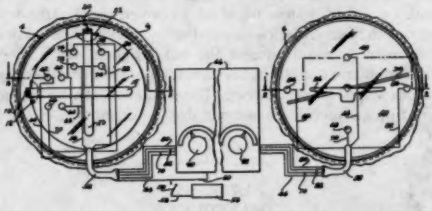
A data system having data communication over a pair of electrical conductors includes a filter for eliminating static noise of atmospheric origin. In a specific embodiment, a system for acquiring seismic data includes a static filter for attenuating a common mode signal and atmospheric noise while preserving desired difference mode data. A specific embodiment of the filter includes a pair of input inductors having a piar of series connected capacitors and a pair of series connected resistors in parallel and connected across the conductors, with the nodes between the two capacitors and two resistors being connected to a common reference potential. The inductors are wound on the same core to effectively cancel the inductance presented to the difference mode signal.

3,778,760

INTEGRATED FLIGHT INDICATORS

Murray L. Jayne, 8609 Lakeshore Dr., Kenosha, Wis.

Filed June 17, 1971, Ser. No. 154,120
Int. Cl. B64d 43/00
U.S. Cl. 340—27 NA 8 Claims



This disclosure relates to an arrangement to be used in conjunction with spaced instruments whereby the indications of one of the instruments may be in effect superposed on another instrument while all of the instruments remain unimpaired and entirely readable and usable at all times in their intended manner.

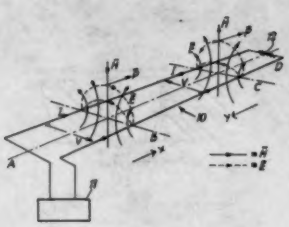
3,778,761

VEHICLE ORIENTATION DETERMINATION

Alan H. Cribbins, Derby, England, assignor to British Railways Board, London, England

Filed Feb. 10, 1972, Ser. No. 225,046
Claims priority, application Great Britain, Feb. 25, 1971, 5442/71
Int. Cl. G08g 1/01
U.S. Cl. 340—39 3 Claims

This invention relates to a device for determining the orientation of a vehicle so that this information can be used to correlate automatic vehicle control equipment to signalling information being received by the vehicle. The device operates by determining the direction of power flow in a terminated conductor loop laid in the path of the vehicle by effectively obtaining the vector product of the magnetic and electric fields associated with the power flow.

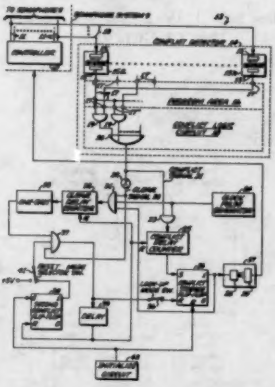


3,778,762

MONITOR FOR DETECTING CONFLICTING TRAFFIC CONTROL SIGNALS

Michael F. Jarko; Avery W. Powers, both of Scotsdale, and Reed A. Newmeyer, Glendale, all of Ariz., assignors to Solid State Devices, Inc., Tempe, Ariz.

Filed July 23, 1971, Ser. No. 165,528
Int. Cl. G08g 1/97
U.S. Cl. 340—46 10 Claims



A monitoring device for use with a traffic control signal system in which the monitor is adapted to detect when a conflict of vehicle or pedestrian proceed signals occurs and switch the system to emergency operation. The monitor may also be employed to detect if the conflict clears and restore the system to normal operation.

3,778,763

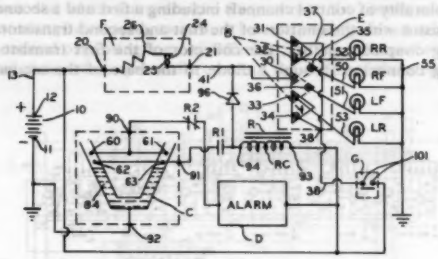
TURN ACTUATED ALARM SYSTEM FOR AUTOMOTIVE VEHICLES

Raymond Johns, and David C. Kuhns, both of Canton, Ohio, assignors to Safety Research and Development Inc., Canton, Ohio

Filed May 18, 1971, Ser. No. 144,482
Int. Cl. B60q 5/00, 1/38
U.S. Cl. 340—55 2 Claims

A centrifugally and/or tilt-actuated switch is provided on an automobile which is actuated when a vehicle travels around a curve at a speed in excess of the safe speed on the curve to operate an alarm and alert the driver that he is moving at an

excessive rate of speed for that curve. The conventional turn signal mechanism on the automobile when actuated deactivates the alarm so that the alarm will not operate when the automobile is going around a sharp corner in a city and will



remain deactivated until the car has returned to normal operation. If the turn indicator is not actuated prior to turning a corner, the alarm will sound to advise the driver that he has not properly actuated the turn signals.

3,778,764

ACCIDENT WARNING AND TRAFFIC GUIDE SYSTEM

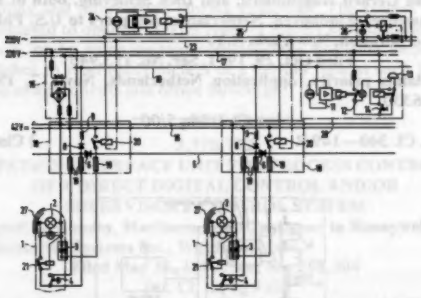
Ludwig Kamb, 27-31 Altriper Strasse, Ludwigshafen (Rhine), Germany

Filed Nov. 24, 1971, Ser. No. 201,857

Claims priority, application Germany, Dec. 4, 1970, P 20 59 804.3

Int. Cl. G08g *1/00*

U.S. Cl. 340—81 R **12 Claims**



An accident warning and traffic guide system particularly useful during fog is installed along an edge of the road. It comprises guide posts spaced along the road edge and carrying a blinking warning light and a warning switch. A safety or cutout fuse is connected in the current supply circuit for each warning light, and the fuses are mechanically protected.

3,778,765

UNIVERSAL CHECK DIGIT VERIFIER/GENERATOR SYSTEMS

Michael Edward Kanter, Hitchin, England, assignor to International Computers Limited, London, England

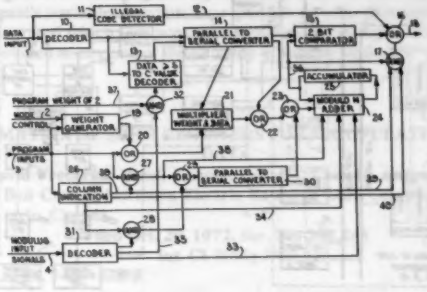
Filed Feb. 14, 1972, Ser. No. 226,110

Claims priority, application Great Britain, Feb. 17, 1971, 4,803/71

Int. Cl. H03k *13/32*; H04l *1/10*

U.S. Cl. 340—146.1 AJ **5 Claims**

A check digit verifying/generating system is capable of operation in a simple verifying mode using a set of predetermined weighted values and modulus. An element of universal application is afforded by an extended mode of operation in



which a selected one of a number of sets of weighting values and a selected modulus is provided for dealing with input signals.

3,778,766

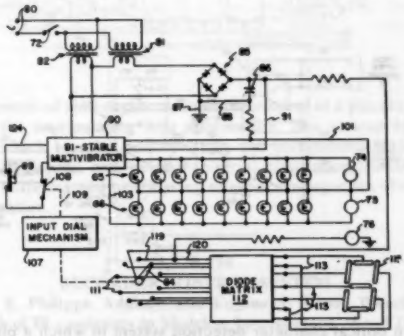
CHECK DIGIT CALCULATOR

Lawrence F. Rapp, c/o Texaco Inc., 135 L. 42nd St., New York, N.Y.

Filed Dec. 29, 1971, Ser. No. 213,461

Int. Cl. G06f *11/10*

U.S. Cl. 340—146.1 AJ **9 Claims**



A modulo ten type check digit calculator. It stores the 10 numerals zero through nine and displays only one of them at a time. After manipulation according to the modulo 10 formula with respect to a given number, the numeral displayed represents the check digit for that given number.

3,778,767

DYNAMIC DEBUG AID FOR COMPUTER DATA COMMUNICATION NETWORKS

Bert Edward Carlyle; Robert Louis Rawlings, both of South Pasadena, and Karl Erich Volk, Sierra Madre, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

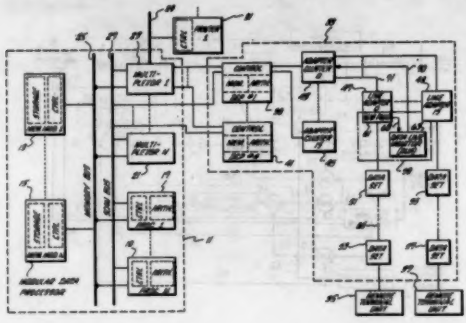
Filed May 30, 1972, Ser. No. 257,578

Int. Cl. G08c *25/00*

U.S. Cl. 340—146.1 R **21 Claims**

For trouble-shooting problems in synchronous, asynchronous, two-wire voltage, or two-wire current communication links between a terminal and a data processor, a line monitor observes the signals going to or coming from a terminal unit and sends them to the processor. The processor

translates them into hexadecimal and mnemonic code messages, and causes their print-out, completely or selective-



ly, along with an indication of the time of day the printed messages were received and the monitoring station (line monitor) they were received from.

3,778,768

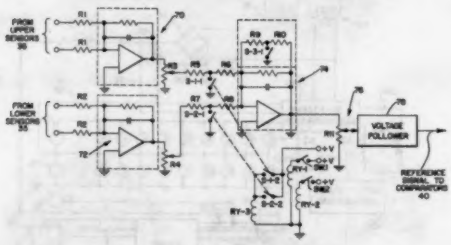
CHARACTER DETECTION SYSTEM

Richard A. Brisk, Somerville; Guy L. Fougere, Lincoln; Lawrence D. Lorah, Concord, and Harvey L. Pastan, Chestnut Hill, all of Mass., assignors to Arthur D. Little Inc., Cambridge, Mass.

Filed Aug. 27, 1971, Ser. No. 175,656

Int. Cl. G06k *9/12*

U.S. Cl. 340—146.3 AG **6 Claims**



An optical character detection system in which a plurality of digital signals are adaptively produced based upon actual characteristics of a character and its background being viewed and reliably representing the presence or absence of a scanned character. An elongated array of photosensors is disposed along a linear axis orthogonal to the path of character travel and arranged for relative motion with characters to be read. The array includes sensors which view the document background above and below the character field to provide a reference signal for comparison with the signals of the character sensors to produce the digital signals representing a character.

3,778,769

SOLID STATE TOUCH CONTROL HAND SET CIRCUIT

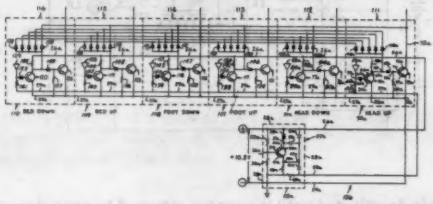
Jose Cheng Tsuen Hong, and Everett Wendell Werts, both of Normal, Ill., assignors to General Electric Company, New York, N.Y.

Filed Apr. 28, 1972, Ser. No. 248,648

Int. Cl. H04q *3/00;* **G08c** *1/00*

U.S. Cl. 340—147 LP **8 Claims**

A solid state touch sensitive control circuit, adapted for embodiment in accordance with one form thereof in a control unit to selectively provide an output to a desired one of a plurality of loads, including oscillator means connectable to a direct current power supply for generating a continuous high frequency signal for transmission to each of a plurality of control channels, the number of control channels corresponding to at least the number of loads to be controlled, and each of the plurality of control channels including a first and a second transistor with the emitters of the first and second transistors being coupled together, the collector of the first transistor being connected through a diode to the base of the second



transistor, the high frequency signal from the oscillator means being applied to the base of the first transistor, a touch sensitive switch means also being connected to the base of the first transistor such that the second transistor which is normally non-conducting is caused to conduct when the touch sensitive switch means is operated thereby providing a power output only to the load associated therewith, and a set of diodes being connected to the collector of the first transistor whereby any channel being operated is detected thereby, preventing other channels from operating at the same time.

3,778,770

SWITCHING SYSTEM HAVING CODED PUSH-BUTTONS

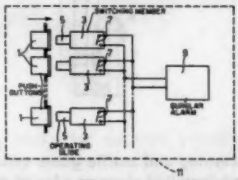
Johan Gerard Hagendoorn, and Dick Schieving, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 29, 1971, Ser. No. 193,945

Claims priority, application Netherlands, Nov. 17, 1970, 7016330

Int. Cl. H04q *5/00*

U.S. Cl. 340—149 R **3 Claims**



An elective lock in the form of a set of pushbuttons which each have an alternately closing and opening contact. The contacts are connected in parallel with one another, so that switching off the lock is possible only by pushing solely the same buttons as are pushed in locking the device.

3,778,771

REMOTE METER READING APPARATUS

William T. Whitaker, 2115 Chestnut St., Wilmington, N.C.

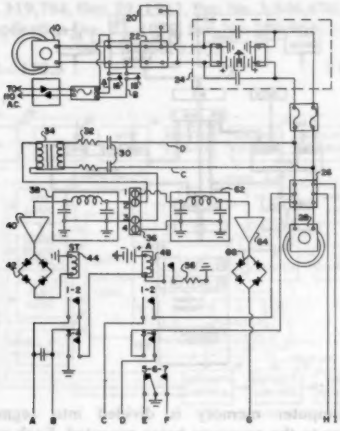
Filed Nov. 22, 1971, Ser. No. 200,792

Int. Cl. H04q *9/00*

U.S. Cl. 340—150 **4 Claims**

At a central utility company station, a customer's telephone number is dialed either manually or automatically, whereupon a first or starting audio frequency tone is impressed upon the telephone trunk line which activates the meter reading ap-

paratus at the subscriber's end. Upon receipt of the starting tone frequency, a starting circuit activates a plurality of fixed frequency oscillators, which in turn are connected to a specially adapted dial face of the utility meter to electrically impart a distinctive frequency tone to each number position. The circuit is completed by means of a tone pickup arm attached each dial which transmits the frequency to the corresponding contact of a stepping switch. A second pulsing circuit receive a second or pulsing tone of differing frequency from the central station to sequentially connect the wiper of the stepping



switch with the electrical path from each of the meter dials, so that each dial may be read. The tone frequency corresponding to the number position of each meter dial is transmitted back to a tone converter at the central station, which converts the frequencies into electrical information which is intelligible to a billing and information storing computer. The system may be adapted to operate several types of meters at a customer location, or by using certain commercially available stepping switches to read many meters of a certain type at such locations as apartments and office buildings.

3,778,772

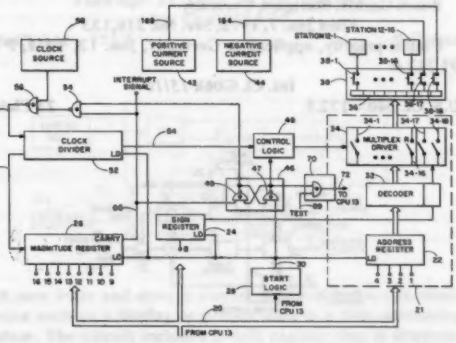
STATION INTERFACE UNIT FOR PROCESS CONTROL OF A DIRECT DIGITAL CONTROL AND/OR SUPERVISORY CONTROL SYSTEM

Russell R. Rhodes, Marlboro, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed May 31, 1972, Ser. No. 258,304

Int. Cl. H04q *9/00*

U.S. Cl. 340—163 **13 Claims**



A station interface unit provides to any one of a plurality of remote stations a control signal for effectuating a change in that station's total charge. With a different charge the selected station's operation is altered. The control signal is a current having a fixed amplitude and a variable duration time period. A two polarity current source provides for either a positive or negative control signal. Upon completion of the control signal's variable duration time period, an interrupt signal is generated which indicates that another control signal may be provided to any one of the plurality of remote stations.

3,778,773

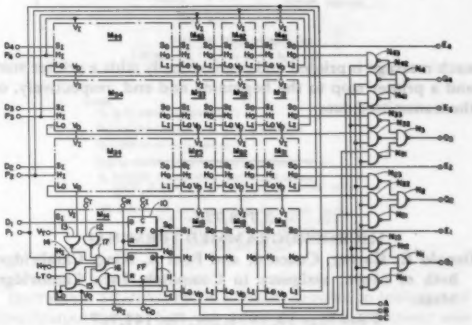
MATRIX OF SHIFT REGISTERS FOR MANIPULATING DATA

David Frederick Hood, Kanata, Ontario, Canada, assignor to Bell Canada-Northern Electric Research Ltd., Ottawa, Ontario, Canada

Filed Oct. 20, 1972, Ser. No. 299,245

Int. Cl. H04g *3/00*

U.S. Cl. 340—166 R **6 Claims**



A matrix of shift registers under the control of a plurality of gates for manipulating data information. The various functions which may be performed by the manipulator include serial-to-parallel and parallel-to-serial conversion, serial-to-serial buffering and interleaving or separating streams of data information.

3,778,774

RECORDER CONTROL SYSTEM

Louis E. Philipps, Addison, and Eugene A. Stanis, Wheeling, both of Ill., assignors to Medelco, Incorporated, Wood Dale, Ill.

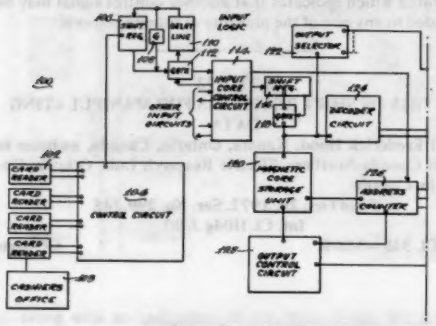
Division of Ser. No. 761,043, Sept. 20, 1968, Pat. No. 3,597,742. This application Mar. 8, 1971, Ser. No. 121,919

Int. Cl. G06f *3/00*

U.S. Cl. 340—172.5 **11 Claims**

A hospital data handling system transmits and receives the message information normally required in hospital operations and automatically withdraws from the transmitted messages all data necessary for establishing such items as bed status data, inventory records, patient charges, etc. The system input is derived from permanent punch cards containing message and control information and disposable punch cards containing variable data, such as patient identifying cards made, for instance, when a patient is admitted. A printer and a card reader are located at each message originating location or station in the hospital to provide messages which are placed in a delay line input storage shared by a group of card readers. As the delay line data is transferred to a core storage unit shared by all the readers, a printer selector checks each message for printer addresses, and a control decoder checks for the type of operation to be performed on the message. If only output recording is required and if all addressed printers are available, the message is cleared from the delay line storage and

read out from the core storage unit to the printers through buffer track message blocks on a drum in a central processor. A printer control automatically moves from block to block as



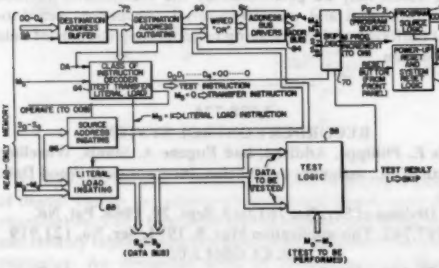
each message is printed and automatically adds a printer start and a printer stop to the beginning and end, respectively, of the transmitted data.

3,778,775

MICROPROGRAMMED TERMINAL

Donald R. Haring, Concord, and Paul A. King, Cambridge, both of Mass., assignors to Computek, Inc., Cambridge, Mass.

Filed May 10, 1971, Ser. No. 141,767
Int. Cl. G06f *3/14*
U.S. Cl. 340—172.5 **22 Claims**



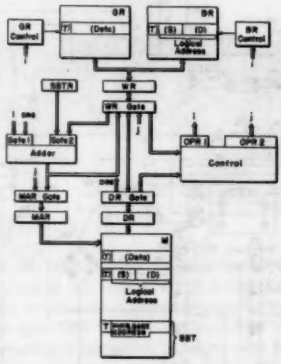
A microprogrammed alphanumeric, computer display terminal comprises a keyboard control, a display oriented single-bus computer, and a display. The single-bus computer includes a processor bus operator, a micro-instruction decoder, and a microprogrammed read-only-memory. Instruction code signals from the keyboard control or from peripheral equipment are applied to a source bus. The processor bus operator accepts data from the source bus and an auxiliary operator register; modified that data in accordance with a computationally complete instruction set; and returns the process data to a destination bus. The micro-instruction decoder includes logic cirucits to convert and decode the data stored in read-only memory into signals required by the bus operator in order to enable the processor to execute the selected instruction. The product of the executed instruction is presented on the display.

3,778,776

ELECTRONIC COMPUTER COMPRISING A PLURALITY OF GENERAL PURPOSE REGISTERS AND HAVING A DYNAMIC RELOCATION CAPABILITY

Katsuya Hakozaki, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Minato-ku, Tokyo, Japan

Filed June 10, 1971, Ser. No. 151,746
Claims priority, application Japan, June 11, 1970, 45/50879
Int. Cl. G06f *3/00*
U.S. Cl. 340—172.5 **2 Claims**



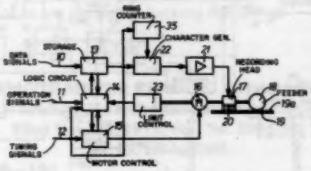
A computer memory is divided into segments with reference to the programs being executed. Each pointer to a physical storage address consists of a segment number and a displacement. A program segment base table is provided in the memory for giving the physical base address for each segment. A tag field of at least one bit is provided in each of the general purpose registers and the addresses in the memory, which carries a tag for indicating whether the data word contains address data or the other data. Back-up registers are provided in one-to-one correspondence to the general purpose registers capable of being loaded with the data words containing the physical addresses. On loading a general purpose register with a data word comprising an address as signalled by the tag, reference is had to the segment base table to load the corresponding back-up register with the pointer. On storing in a segment a data word comprising an address as similarly determined, reference is had to the segment base table to store the data word containing the pointer.

3,778,777

HIGH-SPEED PRINT-OUT ARRANGEMENT USING CONTINUOUSLY ROTATING STEP MOTOR

Peter Liermann, Moglingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 7, 1972, Ser. No. 216,133
Claims priority, application Germany, Jan. 12, 1971, P 21 01 212.4
Int. Cl. G06k *15/10*
U.S. Cl. 340—172.5 **23 Claims**



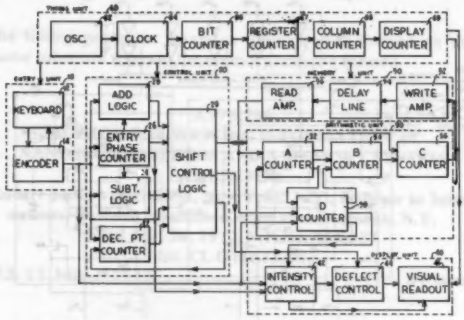
Step motor moves pring-out means across the print-out receiving surface. Motor is started at least one step before

beginning of print-out. Timing for step motor and print-out control derives from a desk calculator whose input numbers, computed totals, etc., are to be printed out.

3,778,778
CALCULATOR WITH SELF-SYNCHRONOUS RECIRCULATING MEMORY

Robert A. Ragen, Hayward, Calif., assignor to The Singer Company, New York, N.Y.

Division of Ser. No. 779,666, Nov. 29, 1968, which is a division of Ser. No. 319,704, Oct. 29, 1963, Pat. No. 3,546,676. This application Dec. 22, 1970, Ser. No. 100,761
Int. Cl. G06f *13/02*
U.S. Cl. 340—172.5 **7 Claims**

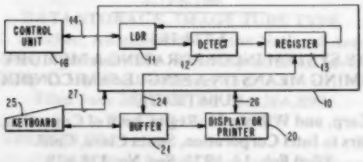


A self-synchronous recirculating memory for use in an electronic calculator. A serial data train having a special synchronizing pulse at the leading end is continuously recirculated through a recirculating memory comprising a dynamic storage device and portions of the calculator arithmetic unit. Each reappearance of the leading sync pulse at the output of the storage device starts the operation of the calculator timing unit. The timing unit is provided with circuitry for automatically stopping the timing unit once a predetermined count is reached. Special circuitry places a sync pulse in the recirculating memory when no data is present therein.

3,778,779
LOGIC AND STORAGE CIRCUIT FOR TERMINAL DEVICE

Victor E. Hake, Lake Katrine; Allen W. McDowell; Daniel R. Mersel, both of Kingston; Lawrence G. Mosher, Rhinebeck, and Stanley O. Stilwell, Staatsburg, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 28, 1972, Ser. No. 248,686
Int. Cl. G06f *3/00*
U.S. Cl. 340—172.5 **9 Claims**

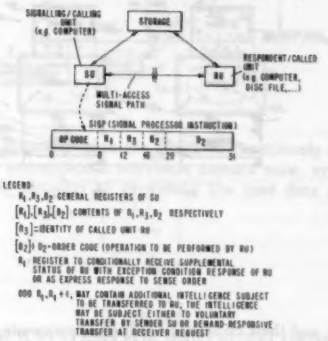


A new logic and storage circuit is provided for a terminal device such as a display or printer used in a data processing system. The circuit includes a shift register that is interconnected with a control unit by a coaxial cable or other two conductor system for transferring serial messages to the control unit and for receiving serial messages from the control unit. The register is connected in parallel with other components of the terminal device. The logic and storage circuit is provided with means for detecting data bits on the two conductor message line and for forming data bits on the line in response to the contents of the register. Means is also provided for decoding control word messages from the control unit and for receiving data messages or transmitting data or status word messages from the terminal device to the control unit.

3,778,780
OPERATION REQUEST BLOCK USAGE

Brian B. Moore, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 5, 1972, Ser. No. 268,959
Int. Cl. G06f *9/00*
U.S. Cl. 340—172.5 **11 Claims**



Instruction SIGNAL PROCESSOR, devoted to initiation of input/output control between an initiating data processor unit and a respondent unit, is used to implement dispatching operations by transferral of Operation Request Block (ORB) storage space addressing intelligence and interruption priority level intelligence from the initiating unit to the respondent unit. The priority level intelligence is prepared by the initiating unit in said space and thereby implicitly conveyed with the addressing intelligence. The ORB space is accessible to both units. After execution of the instruction the units disconnect and the respondent unit, when in suitable enabled status, independently performs the dispatched operation generally designated by order code intelligence transferred to it during the instruction execution sequence. Upon completing such operation the respondent unit signals request for priority interruption of the initiating unit at said priority level. When this request is accepted the units re-connect and the respondent unit revertively transfers the ORB space addressing intelligence to the initiating unit enabling the latter to examine messages placed in the ORB space by either unit (e.g. final status of respondent unit, storage address of I/O information transfer, address of program whose execution is contingent upon completion of the dispatched operation, etc.)

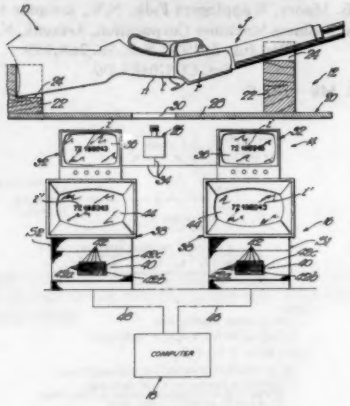
3,778,781
APPARATUS FOR AND METHOD OF REGISTERING FIREARM SERIAL NUMBERS

Miles I. Roth, Orange, Conn., assignor to The Marlin Firearms Co., North Haven, Conn.

Filed Aug. 10, 1972, Ser. No. 279,475
Int. Cl. G06f *3/00*; H04n *1/00*
U.S. Cl. 340—172.5 **3 Claims**

In an installation for registering the serial numbers of firearms in a computer, a plurality of stations, each having a television receiver displaying the image of the serial number of a firearm being registered, and a unit operatively associated with the computer and providing a keyboard and a display screen next to the television receiver, with an operator as-

signed to each station, and each operator instructed first to produce, by selective manipulation of keys of the keyboard, a duplicate of the televised serial number for appearance of an image of the operator-produced number on the display screen, then visually to compare the number images for their identity or non-identity, and finally to cause entry in the computer of the operator-produced serial number if found by the operator to be identical with the televised serial number. The computer is programmed for various processing of the entered serial numbers, including a test of the latter for their identity or non-



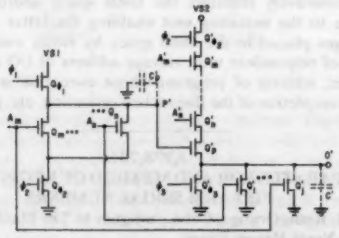
identity, and their clearance for further processing toward registration and storage if found identical, but cancellation of the entered serial numbers if found non-identical and signalling of the non-identity of the entered serial numbers to the operators. Further processing of a cleared serial number includes a test of the same for possible duplicity with a previously registered and stored serial number, and registration and storage of the cleared serial number if not a duplicate, but cancelation of the cleared serial number if a duplicate, and signalling the duplicity of the serial number to the operators.

3,778,782

IGFET DYNAMIC ADDRESS DECODE CIRCUIT

Norihisa Kitagawa, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 12, 1971, Ser. No. 161,816
Int. Cl. G11c 7/00
U.S. Cl. 340—173 R **14 Claims**



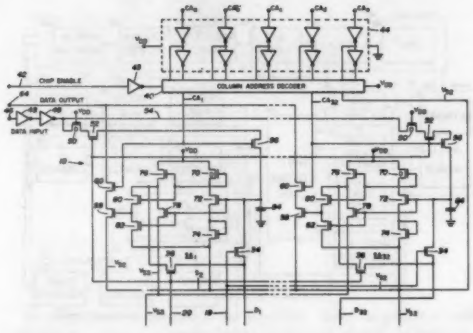
Disclosed is a high speed low power dynamic address decode circuit integrated on a monolithic chip. The circuit requires only two clocks for operation and utilizes only true data inputs, thereby eliminating the need for data complement input lines. The circuit exhibits zero static power loss and increased packing density as compared to conventional decode circuits requiring both true and complementary input signals. To provide generally faster dynamic operation, the circuit precharges line and inherent capacitance prior to application of the data pulses.

3,778,783

DYNAMIC RANDOM ACCESS MEMORY

Robert J. Proebsting, Richardson, and Vernon George McKenny, Garland, both of Tex., assignors to Mostek Company, Carrollton, Tex.

Filed Nov. 29, 1971, Ser. No. 202,987
Int. Cl. G11c 11/40
U.S. Cl. 340—173 R **26 Claims**



A dynamic random access memory utilitizing MOSFET transistors formed on a single semi-conductor chip is described. The random access memory utilizes 1024 binary storage cells arrayed in rows and columns. Each row of cells has a read line and a write line. Each column of cells has one data line used for both read and write functions. Each cell is comprised of a write transistor and a pair of read transistors. The write transistor couples a capacitive storage node to the data line and is controlled by the write line.

The read transistors are connected in series between the data line and V_{SS}, and one is controlled by the read line and the other is controlled by the voltage on the storage node. A sense amplifier is provided for each data line and is used to apply data through the write transistor to the storage node, and to sense the state of the second read transistor controlled by the data stored on the storage node. The chip includes row and column address means for selecting a particular cell for either read or write mode.

The chip also includes a number of features to prevent bipolar injection caused by forward biasing a PN junction as a result of capacitive coupling between various nodes in the circuit, and other features which prevent the loss of data from the storage node.

3,778,784

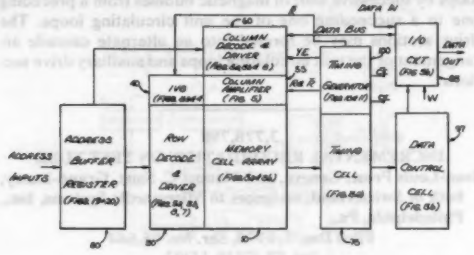
MEMORY SYSTEM INCORPORATING A MEMORY CELL AND TIMING MEANS ON A SINGLE SEMICONDUCTOR SUBSTRATE

Joel A. Karp, and William M. Regitz, both of Cupertino, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Feb. 14, 1972, Ser. No. 225,829
Int. Cl. G11c 11/40
U.S. Cl. 340—173 R **23 Claims**

A memory system is disclosed wherein the system may be controlled by providing a single clock signal to an array of memory cells on a monolithic semiconductor substrate. The substrate includes a timing generator means. The controlling of a memory array by a single clock contributes to the practi-

cal attainment of an ingrated circuit wherein a higher density of memory cells is formed. To accomplish this, in addition to



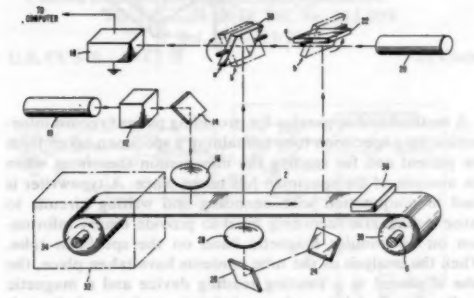
the timing generator means, a timing cell is formed on the same substrate wherein the memory cells are formed.

3,778,785

METHOD FOR WRITING INFORMATION AT NANOSECOND SPEEDS AND A MEMORY SYSTEM THEREFOR

Robert Jacob von Gutfeld, New York, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 20, 1972, Ser. No. 246,027
Int. Cl. G11c *13/00*
U.S. Cl. 340—173 LS **8 Claims**



A method is provided in which information may be written at ultrahigh speed onto a memory material, limited only by the pulse time of a laser beam employed. A semiconductor memory material capable of changing from the crystalline to the amorphous state, each state being stable at ambient conditions, is utilized. Information may be written and stored by exposing discrete portions of the semiconductor material to a high speed pulsed laser wherein said exposed portions are converted from the crystalline to the amorphous state.

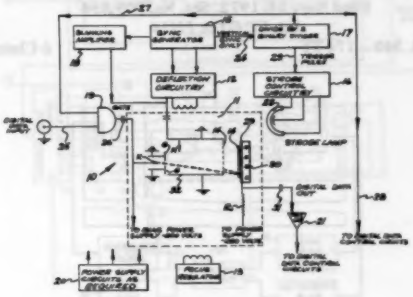
3,778,786

DATA STORAGE, IMAGE TUBE TYPE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Phillip C. Lipoma, Dickinson, Tex.

Filed June 28, 1972, Ser. No. 266,899
Int. Cl. G11c *11/30*
U.S. Cl. 340—173 CR **5 Claims**

Method and apparatus for the storage of digital or analog electrical signals are provided by a memory storage system employing a conventional vidicon tube. At the beginning of an operating cycle, the vidicon is conditioned to accept electrical data input by exposing its photosensitive target to a short, high intensity light flash. A first electron beam scan of the photosensitive surface by an electron beam modulated by the input data then sets up a charge pattern on the photosensitive target which is representative of the input data. A second electron beam scan of the photosensitive surface by an unmodulated electron beam then develops an output signal across an output resistor by means of capacitive currents. The conditioning and scanning steps are operated repetitively at high speed using conventional television camera scan, sync and power supply circuitry to provide a low cost data storage system.

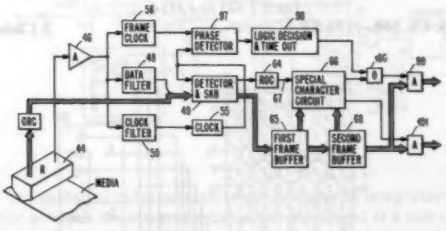


3,778,787

READBACK SYSTEMS FOR DIGITAL RECORDERS

Maxwell R. Cannon, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 229,214, Feb. 18, 1972. This application Apr. 9, 1973, Ser. No. 349,575
Int. Cl. G11b *5/02*
U.S. Cl. 340—174.1 H **21 Claims**

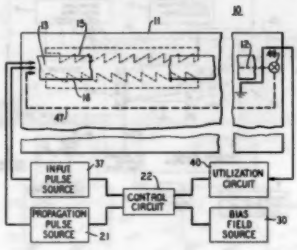


A digital magnetic recorder uses up to twice the Nyquist bandwidth of a data signal, plus a clock signal at a frequency exactly equal to the bit rate for reliably exchanging data signals with a magnetic media. The frequency response of the recording system is greater than twice the Nyquist bandwidth of the data signals to be recorded. Optionally, additional control signals at frequencies above or below the clock frequency but within the available recorder bandwidth may be recorded. Preferably, in a multitrack magnetic recording system, a signal component is added at a frequency near the clock frequency such that the difference between this signal and the clock has a wavelength on the magnetic media greater than the maximum skew of the multi-track system. Such signal component is usable as a resynchronization pattern. Additionally, write errors are detected during recording with special control indicia recorded on the media indicating such errors. Various forms of indicia are described including special data patterns, special signal components, and the like.

3,778,788
SINGLE WALL DOMAIN PROPAGATION ARRANGEMENT

Andrew Henry Bobeck, Chatham; John Alexander Copeland, III, Gillette, and Raymond Wolfe, New Providence, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 24, 1972, Ser. No. 309,056
Int. Cl. G11c *11/14*
U.S. Cl. 340—174 TF **6 Claims**

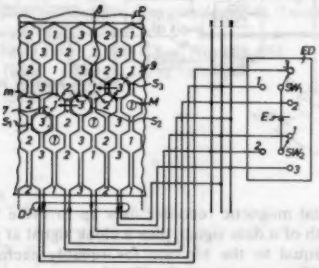


Domain propagation along a path defined by a straight line conductor is achieved by driving domains back and forth across the conductor against the edges of regions forbidden to the domains. By angling the edges of the regions with respect to the axis of the conductor and by offsetting those edges associated with one edge of the conductor with respect to those associated with the other, the back and forth motion is translated into movement along the axis.

3,778,789
HIGH-SPEED TRANSMISSION SYSTEM FOR MAGNETIC BUBBLES

Teruji Watanabe, Niza, and Hideo Ishihara, Kamakura, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo-to, Japan

Filed Aug. 7, 1972, Ser. No. 278,472
Claims priority, application Japan, Aug. 10, 1971, 46/59961
Int. Cl. G11c *11/14*
U.S. Cl. 340—174 TF **3 Claims**

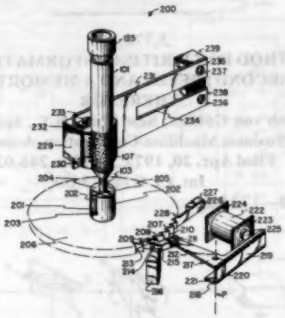


A transmission system for magnetic bubbles in a magnetic plate by use of a number of hold sections closely disposed on the magnetic plate, in which the hold sections are drive sections excited by three phase drive currents. The drive sections are formed into a cascade arrangement of a plurality of unit circulating loops, each of which comprises three drive sections excited respectively by the three-phase drive currents and disposed adjacently to one another, so that a magnetic bubble circulates in each of the unit circulating loops while a magnetic bubble held in a drive section (excited by a drive current of phase I by way of example) of a unit circulating loop can be shifted to a drive section (excited by a drive current of phase II succeeding to the phase I) of an immediately adjacent circulating loop. If an input magnetic bubble is applied to one of the unit circulating loops, an output magnetic bubble can be simultaneously obtained from another of the unit circulating loops by successive shift of magnetic bubbles from a preceding one to a succeeding one of the unit circulating loops. The drive sections may be formed into an alternate cascade arrangement of the unit circulating loops and auxiliary drive sections.

3,778,790
INCREMENTAL RECORDATION ON TEST TUBE

Jean-Louis Prost, Geneva, and Manuel C. Sanz, Grand-Lancy, both of Switzerland, assignors to Micromedic Systems, Inc., Philadelphia, Pa.

Filed Dec. 7, 1970, Ser. No. 95,644
Int. Cl. G11b *15/02*
U.S. Cl. 340—174.1 A **2 Claims**



A method and apparatus for providing patient record information on a specimen tube containing a specimen taken from the patient and for reading the information therefrom when the analysis of the specimen has taken place. A typewriter is used in conjunction with encoding and writing circuits to cause a magnetic recording head to provide binary information on an annular magnetic band on the specimen tube. When the analysis of the tube contents have taken place, the tube is placed in a rotating reading device and a magnetic reading head picks up the coded information and through decoding circuitry either prints out the information and/or stores it in a computer along with the results of the specimen analysis.

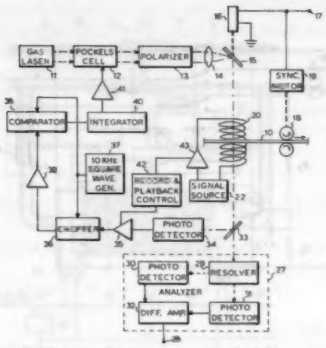
3,778,791
THERMOMAGNETIC RECORDING AND MAGNETO-OPTIC PLAYBACK SYSTEM HAVING CONSTANT INTENSITY LASER BEAM CONTROL

George W. Lewicki, Studio City, and John E. Guisinger, Altadena, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 34,989, May 6, 1970, abandoned. This application Oct. 6, 1971, Ser. No. 187,143
Int. Cl. G11b *11/10*; G02f *1/22*; G01j *1/32*
U.S. Cl. 340—174.1 M **9 Claims**

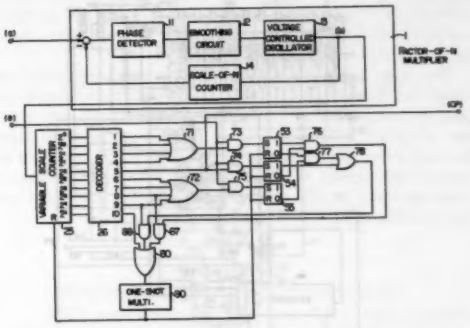
Apparatus is disclosed for maintaining the intensity of a laser beam substantially constant in a thermomagnetic recording and magneto-optic playback system wherein an isotropic film is heated along a continuous path by the laser beam for recording. As each successive area of the path is heated locally to the vicinity of its Curie point in the presence of a controlled magnetic field, a magneto-optic density is produced proportional to the amplitude of the controlled magnetic field. To play back the recorded signal, the intensity of the laser beam is reduced and a Faraday or Kerr effect analyzer is employed, with a photodetector, as a transducer for producing an

output signal. The light intensity of the laser beam is continuously detected close to the analyzer, particularly during



playback operation, and compared with a reference to maintain intensity substantially constant.

synchronizing clock signal. The counter is operated as a scale-of-(n−1) or scale-of-(n+1) counter during the correction of the phase of the clock signal so that the phase of the clock

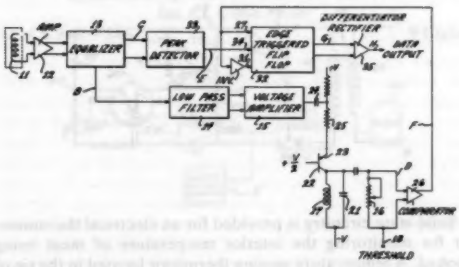


signal can be satisfactorily corrected with suitable inertia regardless of whether the correction is carried out in a sector gap or in a sector.

3,778,792
BLANKING CIRCUIT FOR HIGH RESOLUTION DATA RECOVERY SYSTEMS

Gene Emmett Milligan; Henry Minglo Ho, both of Torrance, and Noboru Kimura, Gardena, all of Calif., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Apr. 10, 1972, Ser. No. 242,509
Int. Cl. G11b *5/02*
U.S. Cl. 340—174.1 H **11 Claims**



A circuit for blanking unwanted error-causing peaks in the waveform derived from the reading of high density magnetic recordings wherein the data waveform is filtered by a low pass filter and variable Q resonant filter to generate a rectangular wave blanking signal applied to a flip-flop together with the equalized signal, whereby false peaks in the equalized signal are prevented from triggering the flip-flop by the blanking signal.

3,778,793
CLOCKING SYSTEM FOR MAGNETIC MEMORY

Yukitaka Hayashi; Akira Osawa; Hakuichi Shimizu, and Nagaharu Hamada, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

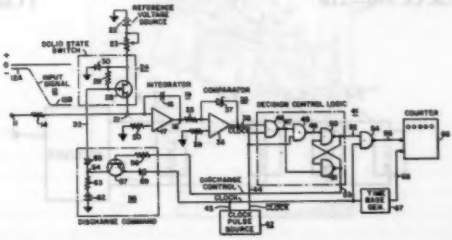
Filed Sept. 11, 1972, Ser. No. 287,639
Int. Cl. G11b *5/00*
U.S. Cl. 340—174.1 A **5 Claims**

A clocking system for a magnetic memory in which a signal obtained by multiplying the frequency of a fixed clock signal by a factor of n is applied to a variable scale counter operating normally as a scale-of-n-counter, and an output appearing from a specific bit position of this counter is used as a

3,778,794
ANALOG TO PULSE RATE CONVERTER

Andras I. Szabo, Export; William E. Zitelli, Pittsburgh, and Dan V. Tarli, North Versailles, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 18, 1972, Ser. No. 290,052
Int. Cl. H03k *11/10*; G11b *5/00*
U.S. Cl. 340—174.1 A **6 Claims**



An analog to pulse rate converter includes an integrator circuit in which the integrator capacitor is charged at a rate corresponding to the level of an input signal. A logic control circuit causes the capacitor to discharge at a fixed rate during a fixed portion of the clock period whenever the capacitor charges above a predetermined charge level. Output pulses occur during each discharge cycle. The average frequency of the output pulses indicates the level of the input signal.

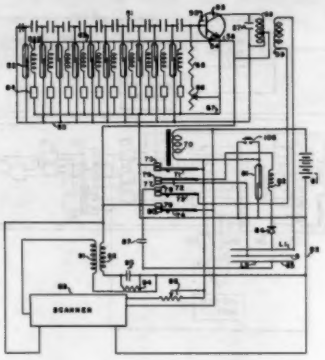
3,778,795
REMOTELY CONTROLLED AUTOMATIC UTILITY METER READER

James P. Campman, Silver Spring, and Jack H. Linscott, 7203 Fairfax Rd., Bethesda, both of Md., assignors to said Linscott, by said Campman, Bethesda and Vidar Laboratories, Inc., Kensington, Md., part interest to each

Filed Mar. 13, 1972, Ser. No. 233,885
Int. Cl. G01f *15/06*
U.S. Cl. 340—188 R **1 Claim**

A remotely controlled apparatus for reading a plurality of dials of a totalling type meter in sequence, for producing a plu-

rality of signals, one signal for each dial read, with the character of the signal determined by the position of the indicator relative to its dial and which automatically terminates its activity when all of the dials have been read.



3,778,796

FIRE ALARMING SYSTEM

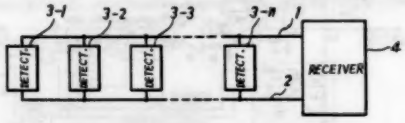
Yukio Honda, Tokyo, Japan, assignor to Nittan Company, Limited, Tokyo, Japan

Filed Mar. 2, 1971, Ser. No. 120,178

Claims priority, application Japan, Mar. 31, 1970, 45/26842

Int. Cl. G08b *17/10, 25/00*

U.S. Cl. 340—216 **1 Claim**



A fire alarm system having a plurality of detectors connected to a pair of conductors, a receiver and a power supply connected to said conductors and an alarm connected to the power supply and said conductors so that an alarm is sounded upon activation of a detector, each detector upon activation producing a preselected AC signal for transmission to the receiver and the receiver includes band pass filters activated by particular frequencies and having associated indicating means so that the activated detector and therefore the location of the fire or smoke can be immediately determined.

3,778,797

MULTI-STATION SAFETY MONITOR HAVING SHUNT SWITCH

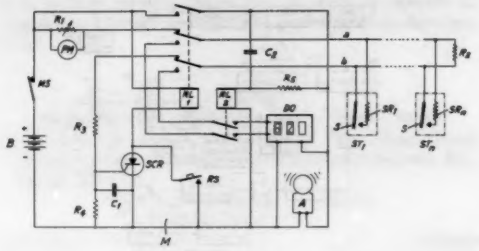
Gene W. Killen, Clintwood, Va., assignor to Pyott-Boone, Inc., Trazewell, Va.

Filed July 10, 1972, Ser. No. 270,307

Int. Cl. G08b *29/00*

U.S. Cl. 340—227 R **12 Claims**

A device for monitoring a plurality of remote stations for disorders in which a high-impedance station line circuit is shunted by a disorder-responsive station switch with a distinctive lower resistance, whereupon a relay actuates an alarm and switches the station line circuit into an ohmmeter circuit. The storage-type digital ohmmeter indicates the location of the responding station; its readout is blocked after receipt of the first reading.



3,778,798

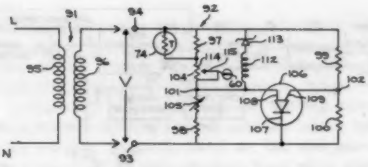
FOOD PREPARATION ELECTRIC THERMOMETER ALARM CIRCUIT

Henry J. Heit, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed May 1, 1972, Ser. No. 249,386

Int. Cl. F24c *15/00*

U.S. Cl. 340—228 R **9 Claims**



Solid-state circuitry is provided for an electrical thermometer for monitoring the interior temperature of meat being cooked. A temperature sensing thermistor located in the tip of a probe, adapted to be partially inserted in meat being cooked so as to monitor the interior temperature, is combined in circuit with a programmable unijunction transistor (PUT), used as a bridge detector, and a signal buzzer such that upon the reaching of a preset temperature within the meat, the buzzer is actuated. The self-heat of the thermistor probe provides a latching effect ensuring the continued firing of the PUT with the resultant smooth operation of the buzzer. A zener diode is combined in circuit to allow a slight back current to flow through the buzzer, thereby allowing the use of a buzzer with a fairly non-critical air gap.

3,778,799

SAFETY DEVICE FOR PIPE LINES UNDER GAS PRESSURE

Jacques Bendayan, Lyon, France, assignor to Cables de Lyon-Alsacienne-Geoffroy. Delore, Lyon, France

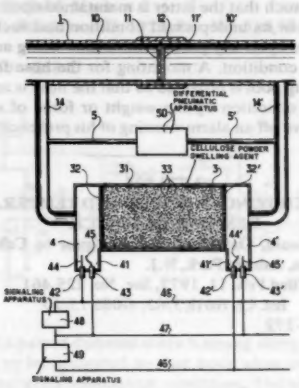
Filed Mar. 28, 1972, Ser. No. 238,772

Int. Cl. G08b *21/00*

U.S. Cl. 340—235 **11 Claims**

A safety device for interrupting the communication between two pipe line sections, which are under the pressure of gas, in response to detection of propagation or infiltration of a liquid from one section toward the other one, charac-

terized in that it comprises an enclosure including at each of the ends thereof a compartment respectively connected to one of said sections, and in the central portion thereof a chamber



separated from each of said compartments by means of a filter retaining a swelling agent which becomes impermeable under the effect of moisture.

3,778,800

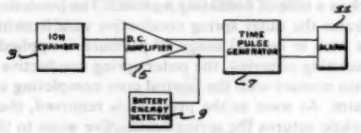
SELF-MONITORING BATTERY OPERATED CIRCUIT

Lyman L. Blackwell, and Paul A. Staby, both of Denver, Colo., assignors to Statitrol Corporation, Lakewood, Colo.

Continuation-in-part of Ser. No. 876,156, Dec. 4, 1969, Continuation of Ser. No. 546,663, May 2, 1966. This application Apr. 9, 1971, Ser. No. 132,690

Int. Cl. G08b *19/00*

U.S. Cl. 340—249 **9 Claims**



Time pulse generator having biasing means therefor including a control device, which may be a transistor and means interconnecting the biasing means to the battery being monitored. The output of the time pulse generator is utilized to drive a signaling device to indicate a low level of battery energy and/or an alarm condition as detected by an external condition sensor.

3,778,801

APPARATUS FOR INDICATING VOLTAGE PRESENCE, PHASE SEQUENCE, VOLTAGE MAGNITUDE, GROUND FAULTS, ETC. IN AN ELECTRICAL POWER DISTRIBUTION SYSTEM

Jean-Claude Nudelmont, 130 rue J. P. Timbaud, Courbevoie, Hauts-de-Seine, France

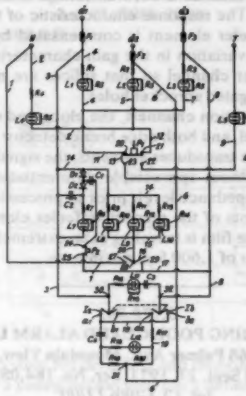
Filed Apr. 12, 1971, Ser. No. 133,049

Claims priority, application France, Apr. 10, 1970, 7013010; Mar. 24, 1971, 7110378

Int. Cl. G08b *19/00*

U.S. Cl. 340—253 R **12 Claims**

An apparatus for monitoring circuit continuity, phase sequence, voltage magnitude, ground connection, etc. in a multi-phase electrical distribution network. A first series of indicator lamps monitor circuit continuity from phase to phase and from phase to ground. A second series of selectively thresholded lamps indicate voltage magnitude and additional indicator lamps are provided to indicate phase sequence and the presence of alternating current.



3,778,802

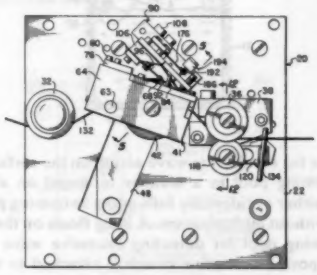
FILM INSPECTION APPARATUS

Richard R. Wallace, Wilmette, Ill., assignor to The Harwald Company, Evanston, Ill.

Filed Mar. 20, 1972, Ser. No. 236,368

Int. Cl. G08b *21/00*

U.S. Cl. 340—260 **19 Claims**



A film inspection apparatus is provided for detecting partial transverse breaks extending inwardly from an edge of the film, wherein the film is moved at extremely high speed over the periphery of a roller with an edge thereof overhanging the side of the roller to form a stiff arcuate portion which will withstand considerable outwardly directed radial force without substantial bending. A feeler element is biased into engagement with the concave side of said arcuate portion and moves radially outward when a generally transverse break in said edge is encountered. This radially outward movement of the feeler element deflects a cantilever beam piezoelectric element to produce a corresponding electrical signal.

Film splices are also detected and counted while eliminating low amplitude or short duration pulses which may be due to dirt or other contaminants on the film. Splices longer than a predetermined amount are also detected and the film stopped, while facilities are provided for preventing the machine from being stopped in response to a series of closely spaced good splices which individually have a length less than said predetermined amount. Compensation is also provided for changes in film speed as the film is brought up to full speed so that relatively short good splices are not falsely interpreted as longer bad splices and the machine stopped.

Elongated sprocket holes are detected by engagement of a feeler element with a straight line portion of the film so that vibration of the feeler element due to chord effect is eliminated and vibration is not transmitted to the edge break feeler elements. The response characteristic of the elongated sprocket hole feeler element is compensated by mechanical damping and by variation in the gain characteristic of the associated amplifier channel so that splices are not falsely interpreted as elongated sprocket holes.

The splice detection channels, the elongated sprocket hole detection channel, and both edge break detector channels employ piezoelectric transducer elements, the signals from which are amplified without appreciable differentiation and transformed to low impedance levels prior to processing so that the desired movements of the respective feeler elements may be detected while the film is traveling at an extremely high rate of speed in the order of 1,600 feet per minute.

3,778,803

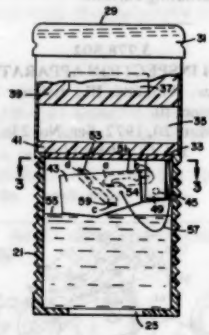
SWIMMING POOL GUARD ALARM UNIT

Darrel S. Jahn, 168 Palmer Ave., Mountain View, Calif.

Filed Sept. 27, 1971, Ser. No. 184,085

Int. Cl. G08b *13/00*

U.S. Cl. 340—261 **11 Claims**



A device for monitoring wave action on the surface of water in a swimming pool in a manner to sound an alarm when someone either accidentally falls into a swimming pool or uses the pool without authorization. A buoy floats on the surface of the swimming pool for detecting excessive wave action. At least one position-sensitive switch is attached to a pivotably mounted float within the buoy for detecting such wave action. A signal from the switch in the buoy is transmitted to a remote alarm unit either by a direct wire connection or by a low power radio transmitter located within the buoy.

3,778,804

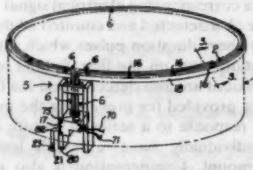
SWIMMING POOL USER WARNING SYSTEM

Leonard T. Adair, 425 W. Fairmount St., Pontiac, Mich.

Filed Dec. 6, 1971, Ser. No. 204,878

Int. Cl. G08b *13/10*

U.S. Cl. 340—272 **4 Claims**



A swimming pool user warning system which warns as to the presence of a would-be unauthorized user of a swimming pool comprising, in combination, an electrical warning alarm, a normally open electrical switch and a compressible air-filled hose having both a normal undepressed condition and an actuated depressed condition. The hose is constructed in relation to the switch such that the latter is maintained open as long as the former is in its undepressed condition and such that the latter is closed upon any part of the former being actuated to its depressed condition. A mounting for the hose for an outdoor swimming pool is provided so that the hose is actuated to its depressed condition by the weight or force of such user, whereby to give off an alarm warning of his presence.

3,778,805

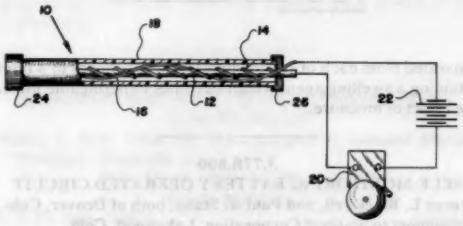
ALARM UTILIZING PRESSURE AND TEMPERATURE RESPONSIVE SWITCH

Robert W. Gould, Oakhurst, N.J., assignor to Cable Switch Corporation, Asbury Park, N.J.

Filed Feb. 11, 1972, Ser. No. 225,461

Int. Cl. H01k *3/02*; **G08b** *13/10*

U.S. Cl. 340—272 **7 Claims**



An electric switch in which an insulator wire and an outer conductive spring wire are wrapped about a central conductive spring wire core with the outer conductive spring wire separated at all points from the central core in its undeformed position. The three elements are normally covered by an insulator such as a tube of insulating material. The insulating winding separates the outer spring conductive wire from the central core wire in normal usage. If pressure is applied to the outer insulating covering, the outer spring conductive wire is forced into contact with the central core completing a circuit to an alarm. As soon as the pressure is removed, the spring characteristic returns the spring conductive wires to their initial position and the alarm circuit is broken. Further, the insulating winding is also temperature sensitive so that, in the case of fire, the outer spring conductive wire will make contact with the central conductive core and again close an alarm circuit.

3,778,806

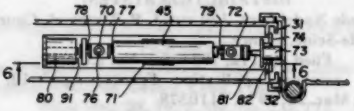
DOOR POSITION SIGNALLING SYSTEM

George J. Williams, 10 Oak Ridge Ln., Albertson, N.Y.

Filed Aug. 5, 1971, Ser. No. 169,525

Int. Cl. G08b *13/08*

U.S. Cl. 340—274 **10 Claims**



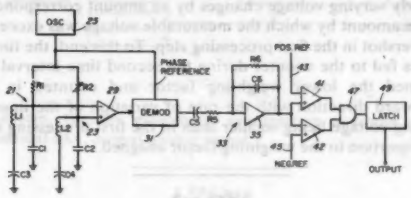
An audible signal unit powered by dry cells or the like is mounted within the hollow frame members of metallic storm or screen doors. The signal portion of the unit uses the frame as a housing and resonant cavity. The entire unit is mounted over an aperture formed in the hinge edge of the door.

3,778,807

CAPACITIVE INTRUSION DETECTION SYSTEM WITH BALANCED RESONANT CIRCUITS

William J. Ralston, Albuquerque, N. Mex., assignor to EG & G, Inc., Bedford, Mass.

Filed Dec. 13, 1972, Ser. No. 314,904
Int. Cl. G08b *13/26*
U.S. Cl. 340—258 C 10 Claims



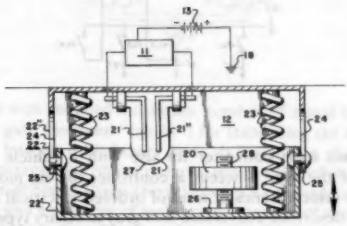
Each of a pair of detector wires is strung along a portion of a boundary to be protected so that both wires are exposed to similar general environmental conditions. The wires are interconnected in respective resonant circuits which are similarly driven at a common frequency so that each resonant circuit provides an a.c. signal having a phase and amplitude which are variable as a function of the capacitance of the respective detector wire. By synchronously demodulating the difference between the two signals, a difference amplitude signal is obtained which is relatively sensitive to differential changes in the capacitances. By employing the rate of change of this demodulating difference signal as an indication of intrusion, a system is obtained which is relatively insensitive to gradual and environmental changes.

3,778,808

ELECTRONIC WEIGHT MONITOR

George S. Stevens, 2106 Washington Way, Richland, Wash.

Filed Jan. 17, 1972, Ser. No. 218,092
Int. Cl. B60q *1/00*; H01h *35/02*
U.S. Cl. 340—282 2 Claims



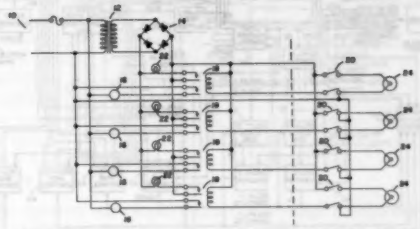
The electronic weight monitor of this invention comprises a control assembly including a switch operable to selectively control electric power to the weight monitor, a relay connected to an input contact to a switch, a lamp connected to a ground and to one of the output contacts of the relay, and a warning means connected to a ground and to the remaining output contact of the relay. A load cell housed in a container comprising a base having sidewalls and a lowermost terminal wall is provided. A platform having an uppermost terminal wall and sidewalls operable to slidably engage the sidewalls of the base, and an urging means operable to urge the base toward the platform are provided. The load cell includes a permanent magnetic field disposed in the base, and a reed-type switch which has one of its reeds connected to a ground and its opposing reed connected to the remaining input contact of the relay. The electronic weight monitor may include a magnetic field having adjusting means operable to selectively position the magnetic field relative to the base.

3,778,809

TIMER CONTROLLED ALARM SYSTEM

John W. Hawes, 513 Longwood Dr. N.E., Cedar Rapids, Iowa

Filed Apr. 5, 1971, Ser. No. 131,175
Int. Cl. G08b *29/00*
U.S. Cl. 340—309.5 R 3 Claims



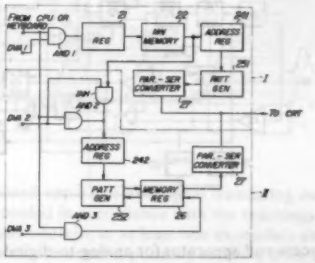
An alarm system for detecting and recording the time of arrival home of a young person who has a definite curfew for his or her return. The system allows the parents of the young person to reture for the evening with the assurance that they will be awakened if their son or daughter does not return on time, but will not be disturbed if he or she arrives home on or before the appointed time.

3,778,810

DISPLAY DEVICE

Yokitaka Hayashi, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sept. 9, 1971, Ser. No. 178,926
Int. Cl. G08b *5/36*
U.S. Cl. 340—324 AD 4 Claims



A display device comprising a computer processing unit, a controlling unit including a pattern generator, and a display tube. The pattern generator not only memorizes the predetermined patterns for displaying the normal figures, letters, etc. but also has a read-write function for displaying special figures, etc.

3,778,811

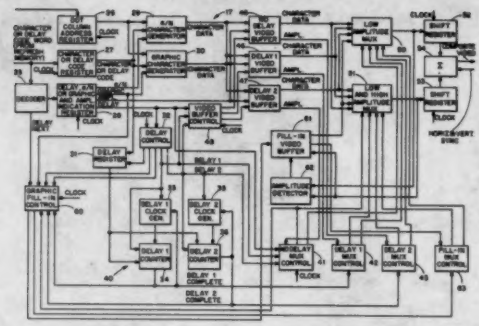
DISPLAY SYSTEM WITH GRAPHIC FILL-IN

Francis A. Gicca, Bedford; Francis C. Passavant, West Newton; William W. Stebbins, Framingham, and Allen J. Worters, Newton Highlands, all of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 21, 1972, Ser. No. 264,969
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 AD 11 Claims

Television-type display system for displaying information in the form of bargraphs. Code words designating individual characters of bargraphs are read out of a random access memory and the characters are displayed at fixed normal loca-

tions on the display surface of the display device. Delay code words designating amounts of delay for fine positioning the top edges of the bars may be associated with the uppermost



character of each bar. The system provides for filling in certain portions of the bars in the display of overlapping bargraphs to produce continuous, uniform bars.

3,778,812

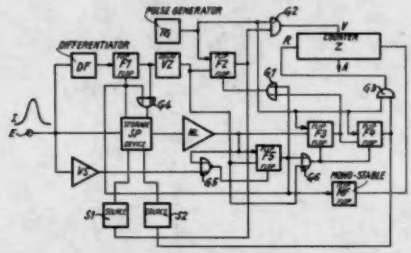
METHOD AND APPARATUS FOR ANALOG-DIGITAL CONVERSION

Abutorab Bayati, Neureut, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 730,067, May 17, 1968, abandoned. This application Mar. 17, 1971, Ser. No. 125,431

Int. Cl. H03k *13/20*

U.S. Cl. 340—347 NT **9 Claims**



A process and apparatus for analog-to-digital conversion includes a storage circuit (SP) having a capacitor which is charged to a value corresponding to the voltage of an input analog signal (I). The change in charge of the capacitor is thereafter measured in terms of a time interval including at least two steps by counting pulses applied to a bidirectional counter during the discharge of the capacitor. The discharge rate employed in subsequent steps of the process is lower than the discharge rate used in the initial step. During the initial step, current from a source (S_1) is applied to the storage circuit (SP) at a higher rate than in the second subsequent step during which the storage circuit (SP) receives current from another current source (S_2). The pulses counted in the counter during the discharge occurring in the initial step of the process have a greater weight than the impulses counted in subsequent steps. To this end, the pulses are added directly to counting stages of higher significance.

An analog digital conversion system employing the concept of first coarsely coding a measured value of voltage corresponding to the amplitude of an analog input signal with the aid of a rapid build-up or slope velocity of a time-linearly increasing voltage and then proceeding with a fine coding operation in subsequent steps by means of lower slope velocities. In the first processing step, coarse coding is effected by measuring the number of stroke or timing pulses which are assigned a predetermined weighting factor and which are fed to a bidirectional counter during a first time interval. The weighting factor assigned the timing pulses in the first processing step is greater than that assigned in the second subsequent processing step during a second time interval in which the direction of change or variation of the time-linearly varying voltage is reversed. During the second processing step, the linearly varying voltage changes by an amount corresponding to the amount by which the measurable voltage was exceeded or overshot in the first processing step. To this end, the timing pulses fed to the counter during the second time interval are assigned the lower weighting factor and counted in the backward direction with the rate of variation of the linearly varying voltage being smaller than in the first processing step in proportion to the weighting factor assigned.

3,778,813

REMOTE CONTROL ARRANGEMENT

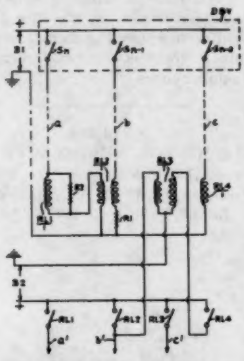
Ivor Henry Bull, London, England, assignor to Westinghouse Brake and Signal Company Limited, London, England

Continuation of Ser. No. 653,812, July 17, 1967. This application Sept. 10, 1971, Ser. No. 179,596

Claims priority, application Great Britain, Aug. 5, 1966, 35,121/66

Int. Cl. H03k *13/00*

U.S. Cl. 340—347 DD **1 Claim**



A digital code converter for use with a vehicle braking system of the type wherein a controller, by its movement, energizes selected ones of a set of ordered electrical conductors. The described conversion is of gray to binary type.

3,778,814

WAVEFORM SYNTHESIZER

Clell A. Dildy, Jr., Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

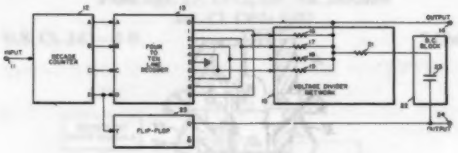
Filed Aug. 7, 1972, Ser. No. 278,662

Int. Cl. H03k *13/00;* **H03b** *19/00*

U.S. Cl. 340—347 DA **8 Claims**

A signal waveform synthesizer system is disclosed as containing a digital input decade counter, a four to 10 line decoder and a flip-flop operatively connected to said decade counter. Said decoder has the 10 outputs thereof interconnected and grounded, respectively, and connected to a voltage divider network for producing consecutive output voltages in such manner as to generate a predetermined first half-cycle analog waveform. A direct current blocking capacitor allows the aforesaid flip-flop to timely reverse the polarity of the reference voltage supplied to said voltage divider network, to

thereby effect a second half-cycle analog waveform that is equal and opposite to the aforesaid first half-cycle analog



waveform, thereby effectively synthesizing a whole cycle, sinusoidal-like, output analog signal.

3,778,815

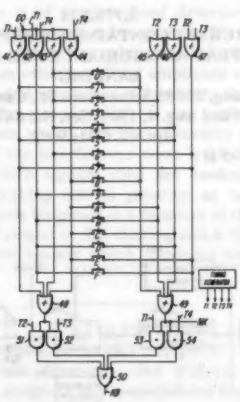
KEYBOARD ENCODER

Carl Macey Wright, Cinnaminson, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 17, 1971, Ser. No. 143,860

Int. Cl. G06f *3/02*

U.S. Cl. 340—365 S **4 Claims**



Circuit with reduced maximum number of signal terminals per logic gate (reduced "fan-in") for translating the selection of a key into an n bit binary code. It includes a plurality of logic gates receptive of *q* of n timing pulses for applying signals indicative of binary digits (bits) through a selected key in one direction and a plurality of logic gates receptive of the remaining *p* timing pulses for applying such signals through the selected key in the opposite direction. A signal, after passing through a key, is gated through one of two logic circuits under the control of the same timing pulse employed to produce the signal, to a common output terminal.

3,778,816

KEYBOARD DATA ENTRY DEVICE EMPLOYING REACTIVE COUPLING CIRCUITS

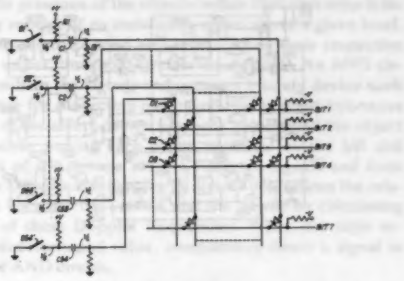
Allen B. J. Cuccio, Oklahoma City, Okla., assignor to General Electric Company

Continuation of Ser. No. 17,840, March 9, 1970, Division of Ser. No. 695,802, Jan. 4, 1968. This application May 3, 1972, Ser. No. 249,811

Int. Cl. G06f *3/02*

U.S. Cl. 340—365 S **7 Claims**

A keyboard device for entering data into a data processing system. Each selection key on a keyboard is coupled to a switch. Each switch is connected to an encoder through a reactive coupler which converts the switch output to pulse form. The device causes data to be delivered to the encoder in



the order in which the selection keys are depressed regardless of how many keys are concurrently depressed.

3,778,817

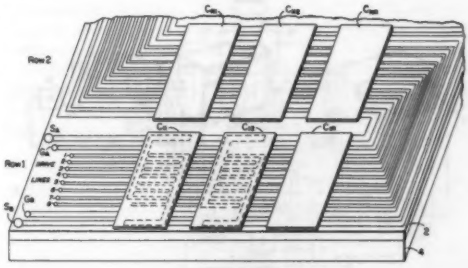
OUTPUT KEYBOARD APPARATUS AND SIGNAL TRANSLATING METHODS THEREFOR

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 2, 1972, Ser. No. 277,264

Int. Cl. G06f *3/02*

U.S. Cl. 340—365 C **44 Claims**



Output keyboard apparatus and signal translating methods therefor are provided in accordance with the teachings of the present invention wherein, in at least one exemplary embodiment, sense conductors and a plurality of drive lines are associated with a selected number of keys within an output keyboard arrangement. A conductor arrangement which acts as a coding and coupling device is provided in association with each of the selected number of keys to selectively couple, upon the actuation of the key associated therewith, signals from the plurality of drive lines to the sense conductors in a predetermined coding sequence representative of the key depressed.

3,778,818

KEYBOARD WITH ROLL-OVER FEATURE

Johannes Hermanus Maria Scholten, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 7, 1972, Ser. No. 304,388

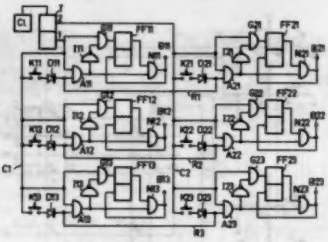
Claims priority, application Netherlands, Nov. 17, 1971, 15804

Int. Cl. G06f *3/02*

U.S. Cl. 340—365 E **2 Claims**

A keyboard has a roll-over feature in that a bistable element (flipflop) is associated with each key. The keys are successive-

ly interrogated. When a depressed key is interrogated, the code data thereof is passed on, and the flipflop is set. If the key



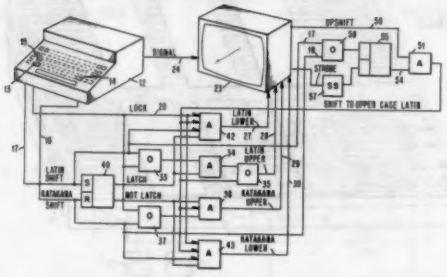
is interrogated again, the flipflop blocks the passage of the code data. When the key is released, the flipflop is reset.

3,778,819

KEYBOARD WITH FOUR CHARACTER SET SHIFT

Venkatesha S. Bhagawan, Kingston; Richard A. Jones, Red Hook; Allen W. McDowell; George D. Mine, both of Kingston; Louis J. Remsburger, Pine Plains; Bruce A. Rupp, West Hurley, and Rodney R. Whittaker, Kingston, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 17, 1972, Ser. No. 307,676
Int. Cl. G06f *3/02*
U.S. Cl. 340—365 S **8 Claims**



A circuit is provided for operating a keyboard in a selected one of four character sets: upper and lower case Latin and upper and lower case Katakana. The circuit responds to signals produced by the familiar Shift and Lock keys of a conventional keyboard. One of the shift keys is designated a Latin shift key and the other is designated a Katakana shift key. Depressing a shift key momentarily sets the keyboard to operate in the lower case of the character set identified by the shift key. For upper case, the operator either sets the shift Lock or holds the appropriate shift key while striking a character key. A specific logic circuit is disclosed.

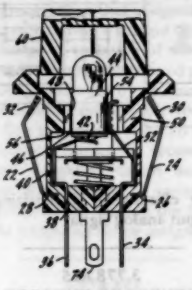
3,778,820

INDICATOR ASSEMBLY WITH INTERLOCKING CONTACT

Peter J. Van Benschoten, Rancho Santa Fe, and Jan Albert Kilsdonk, Corona, both of Calif., assignors to Oak Industries Inc., Crystal Lake, Ill.

Filed May 8, 1972, Ser. No. 251,462
Int. Cl. G08b *5/00*
U.S. Cl. 340—381 R **14 Claims**

An indicator assembly using a flanged lamp and having a housing which includes a pair of lamp contacts. The lamp is electrically connected to the contacts, with one of the contacts biasing the flange of the lamp into an interlocked posi-



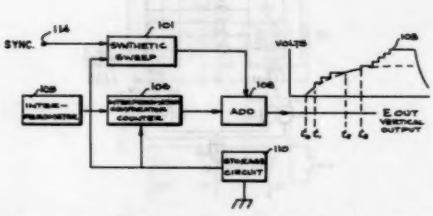
tion with the housing to thus hold the lamp in position, but yet permit easy removal of the lamp from the front of the indicator assembly.

3,778,821

AIRCRAFT CONTAINED PERSPECTIVE RADAR/DISPLAY AND GUIDANCE FOR APPROACH AND LANDING

David W. Young, 23685 Schoenborn St., Canoga Park, Calif.

Filed Aug. 4, 1969, Ser. No. 847,121
Int. Cl. G01s *9/02*
U.S. Cl. 343—5 R **3 Claims**



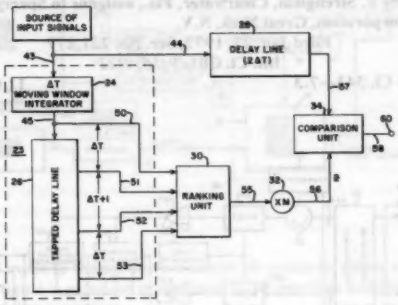
A radar system is disclosed as for providing the pilot of an aircraft with a perspective presentation that is sufficient, for example to land the aircraft under conditions of reduced visibility including zero-zero. The system incorporates a cathode ray tube utilizing B-scope scanning with a somewhat hyperbolic vertical range sweep which may be further varied as a function of the profile of the terrain under investigation where the terrain is not reasonably flat (perpendicular to the local vertical). The sweep signal is developed in a somewhat-basic, synthetic form, for depicting large flat areas (as generally presented by airports). Means are also disclosed for varying the standard in accordance with altitude. A form of the system is also disclosed to vary the display in accordance with roll and pitch of the aircraft. Furthermore, various registration systems are disclosed whereby the perspective display is registered or referenced with regard to the terrain under investigation, as to indicate when the terrain is irregular. Some forms of registration incorporate structure for obtaining accurate visual display of actual irregular terrain. Also means is disclosed for determining (by means of the radar/display) if the aircraft is above or below the predetermined glide slope angle with respect to the local vertical and the end of the runway or landing zone.

3,778,822

SUM-RANK NORMALIZED DETECTION APPARATUS

Lowell W. Bauer, Liverpool, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Apr. 27, 1972, Ser. No. 248,059
Int. Cl. G01s 9/02
U.S. Cl. 343—5 R 7 Claims



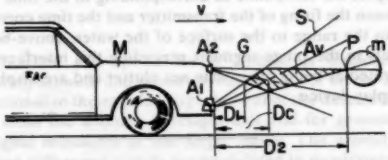
This disclosure is of a normalized detector for use with radar, sonar and other pulse-echo systems. The detector comprises a summing unit and a ranking unit which together provides a continuous estimate of the amplitude of interference and noise received in resolution cells near to that of the input signal sample. The summing unit in one embodiment comprises an integrator which provides a plurality of sum signals representative of the interference noise level during selected time periods, which signals then are ranked among one another in the ranking unit to generate an output deriving from the sum signals weighted as a function of their respective ranks. The signal output of this ranking unit is the normalizing or threshold signal against which the input signal sample is compared.

3,778,823

VEHICLE SAFETY DEVICE

Kazuo Sato; Tomio Hisatsune, and Minoru Izawa, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Aichi-ken, Japan

Filed Apr. 15, 1971, Ser. No. 134,348
Claims priority, application Japan, Dec. 27, 1970, 45/126238
Int. Cl. G01s 9/02
U.S. Cl. 343—7 ED 28 Claims



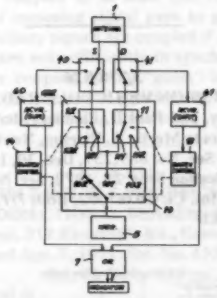
The disclosed apparatus detects an imminent collision between a vehicle and an object, by orienting respective receiver and transmitter antennas, mounted on the vehicle, so their patterns intersect and form a crash detecting zone just ahead of the vehicle, and by deriving the relative speed between the vehicle and the object in the crash zone from an undulatory signal radiated by the transmitter antenna and the reflected undulatory signal received from the object. A generator, a directional coupler, and a detector all associated with the antennas, derive the relative speed between the vehicle and the object on the basis of homodyne detection of the transmitted undulatory signals and the reflected undulatory signals. The presence of the objects within the crash zone is indicated by receipt of an undulatory signal above a given level. When both relative speed and level exceed their respective threshold values, threshold circuits issue signals. An AND circuit responds to the signals and actuates a safety device such as an air bag for protecting passengers. To prevent erroneous actuation of the safety device when the vehicle and the object are on course passing each other, antennas on the left and right sides of the vehicle receive reflected signals and form respective Doppler frequencies. A divider determines the relative angle between the vehicle and the object by calculating the ratio of these Doppler frequencies. When the ratio exceeds a predetermined value, comparators direct a signal to disable the AND circuit.

3,778,824

RADAR SYSTEM FOR DETECTING LOW-FLYING OBJECTS

Joseph Roger, Paris, France, assignor to Thomson CSF, Paris, France

Filed Aug. 23, 1971, Ser. No. 173,818
Claims priority, application France, Aug. 21, 1970, 7030702
Int. Cl. G01s 9/02, 9/22
U.S. Cl. 343—7 A 4 Claims



To eliminate gaps in the vertical radiation pattern of a radar antenna designed to detect low-flying objects, the outgoing microwave energy is transmitted simultaneously over a direct path and over a reflected path with the aid of two horn radiators also serving to discriminate between incoming wave energy received over these two paths. By alternating between cophasal and antiphasal transmission and/or between additive and subtractive reception over these two paths, the optimum mode of operation for a given angle of elevation can be determined.

3,778,825

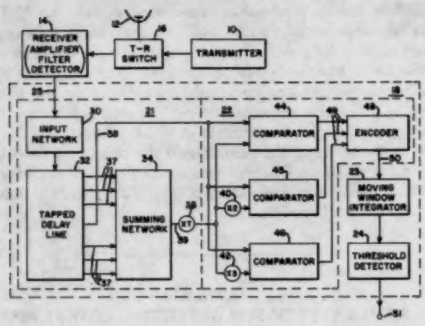
ADAPTIVE QUANTIZING AND INTEGRATING DETECTOR FOR PULSE-ECHO SYSTEMS

Manuel Ares, Manlius, and Lowell W. Bauer, Liverpool, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Apr. 10, 1972, Ser. No. 242,426
Int. Cl. G01s 9/06
U.S. Cl. 343—7 A 3 Claims

This disclosure is of an adaptive quantizing and integrating detector for radar and other pulse-echo systems which pro-

vides a continuous estimate of local interference level by averaging the signal level over a time interval including the received signal sample of interest. The estimate of local interference level thus derived adjusts a variable quantizer which



typically provides two or more discrete levels of quantization, and the quantizer outputs then are combined in a noncoherent integrator. High detection efficiencies can thus be achieved even in environments where interference levels are unknown or changing.

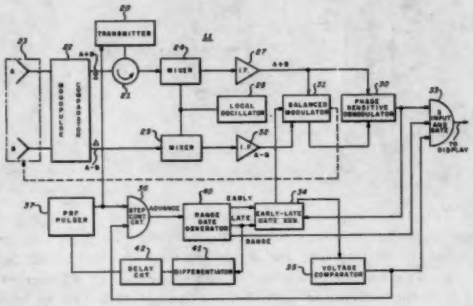
system for the relatively long reaction time of an operator and in being independent of all other parameters such as input from vehicle speedometer, distributor or the like.

3,778,827

SHORT RANGE MONOPULSE MARINE SEARCH RADAR FOR SMALL OBJECT DETECTION

Harry F. Strenglein, Clearwater, Fla., assignor to Sperry Rand Corporation, Great Neck, N.Y.

Filed Jan. 27, 1972, Ser. No. 221,277
Int. Cl. G01s 9/16, 9/22
U.S. Cl. 343—7.3 **11 Claims**



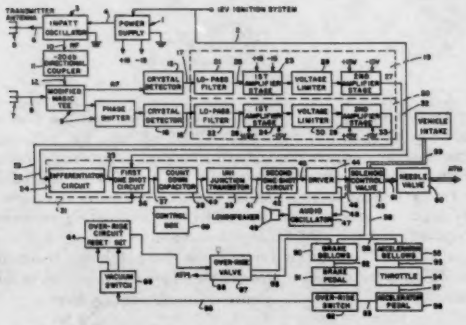
The subject invention comprises a short range monopulse marine search radar for detecting small targets such as channel markers in the water. The radar has its antenna directed so that its monopulse null intersects the surface of the water at an initial minimum range proximate the radar over which sea clutter is below the boresight line. This initial range is investigated by very narrow transmitted rf pulses to determine the presence of targets therein. The antenna is subsequently controlled in elevation by a signal coupled through a balanced modulator to the antenna so that the intersection of the monopulse null and the water surface is positioned at successive increased ranges which are investigated by the very narrow transmitted pulses. At each successive range, the geometry provided by the position of the radar antenna and the position of the monopulse null-water surface interface is such that sea clutter is below the boresight line and each successive range segment is increased exponentially by a range gate. When the range gate and the elevation monopulse both interpret the same time as corresponding to the time interval between the firing of the transmitter and the time corresponding to the range to the surface of the water, above-boresight targets in the range segment preceding this interface are interpreted as being other than sea clutter and are displayed on a display device.

3,778,826

ANTI-COLLISION VEHICULAR RADAR SYSTEM

John B. Flannery, and Paul D. Flannery, both of Chelmsford, Mass., assignors to Merlin A. Pierson, Newton, Mass.

Continuation of Ser. No. 889,237, Dec. 30, 1969, abandoned. This application Sept. 25, 1972, Ser. No. 291,567
Int. Cl. G01s 9/02; B60t 7/12
U.S. Cl. 343—7 ED **9 Claims**



A simplified radar system mounted on a vehicle and having an unmodulated RF signal transmitter-receiver beamed along a path to reflect signals from any obstacle. A novel circuit including an assymmetrical magic tee; an opening and closing Doppler discriminator, a closing Doppler frequency sensing means, a transitory obstacle discriminator and an override means is arranged to control power means which pulses the brakes, when driver inattention, or fog, requires braking or turning in time to avoid collision. The system reacts only in emergency stop situations to avoid collision by substituting the relatively short reaction time of the Doppler sensing radar

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3,778,828

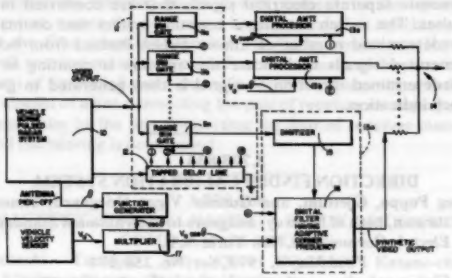
RANGE-GATED DIGITAL AMTI SYSTEM

Wilmer H. McFarland, Fullerton, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed Feb. 27, 1967, Ser. No. 618,823
Int. Cl. G01s 9/42
U.S. Cl. 343—7.7 **23 Claims**

A pulsed energy system for airborne use and having range-gated digital means for doppler processing of moving-target signals. A digitizer generator provides a first pulse train, indicative of the video output of the system receiver, as an up-

count input to an up-down counter. An adjustable pulse train, (corresponding to the function $V_m \cos \theta$) is applied as a down-



count input to the up-down counter. A synthetic video, or display, signal is gated-on in response to an overflow condition of the up-down counter.

3,778,829

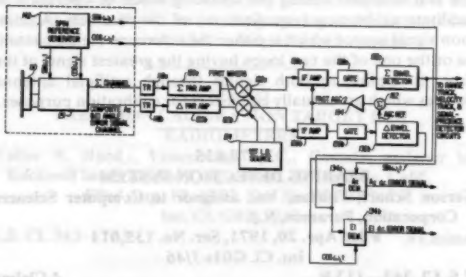
GUARDED MONOPULSE RADAR SYSTEM

R. Noel Longuemare, Jr., Ellicott City, and David H. Mooney, Jr., Arnold, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 18, 1972, Ser. No. 227,542

Int. Cl. G01s 9/22

U.S. Cl. 343—16 M **8 Claims**



A Guarded Monopulse Radar System is disclosed for generating azimuth and elevation difference (or error) signals proportional to the angular displacement of the detected radar target from the antenna boresight axis and for generating a sum signal indicative of the target range. The azimuth and elevation difference signals are modulated in quadrature with sine and cosine signals of a reference frequency. The modulated signals are then added to a portion of the sum signal to provide a composite signal. The aforementioned steps are performed at microwave frequencies and the resultant signals are subsequently converted to IF signals by "beating" with a signal derived from a local oscillator. IF signals corresponding to the sum signal and the composite signal are amplified in a circuitry including fast, automatic gain control (AGC). The amplified signals are then demodulated in accordance with the reference signal to provide signals indicative of azimuth and elevation errors.

3,778,830

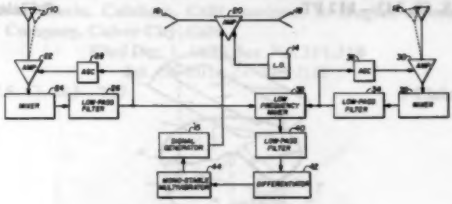
VIBRATION COMPENSATION FOR RANGE DIRECTION FINDER

Horace M. Joseph, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 24, 1972, Ser. No. 283,449

Int. Cl. G01s 3/10, 9/02

U.S. Cl. 343—17.7 **4 Claims**



Apparatus for compensating signal direction of arrival measurements used for direction finding and ranging for phase errors generated by changes in the relative positions of receiving antennas due to vibration or structural weaving. The apparatus can be used to advantage in monopulse radar systems wherein the relative phase between the signals induced in separated antennas is used to deduce target position. Local oscillator power and, when required, auxiliary signals are electromagnetically coupled to at least two identical receivers over portions of incoming signal path to produce a unique error signal. Auxiliary signals are coupled if vibrations are not symmetrical or are not sufficiently in synchronism. The auxiliary signals are coupled during "quiet" intervals when no received signals are present to provide reference signals over the same portions of incoming signal path.

3,778,831

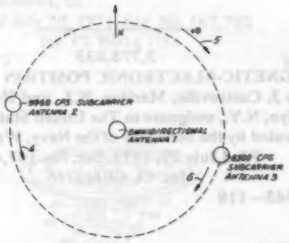
COMPATIBLE DOUBLE PRECISION DOPPLER OMNIDIRECTIONAL BEARING SYSTEM

Nathan Marchand, 311 Riversville Rd., Greenwich, Conn.

Filed Apr. 7, 1971, Ser. No. 132,100

Int. Cl. G01s 1/38

U.S. Cl. 343—106 D **10 Claims**



A circular antenna array has a first antenna and second and third antennas or a first antenna and two pairs of antennas arranged around the first antenna on a circular perimeter of which the first antenna is the center of the circular array. A frequency modulation is generated in the signals associated with the second and third antennas or the two pairs of antennas characteristic of a rotational condition of the second and third antennas or the two pairs of antennas on the perimeter at a low frequency in a manner whereby the second and third antennas or two pairs of antennas are rotated in opposite directions around the perimeter to provide a phase difference

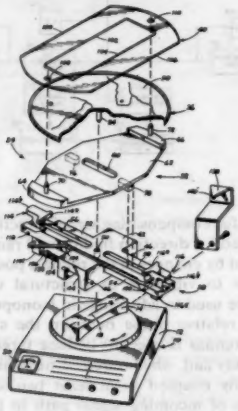
in electrical degrees in the modulation of the signals which are radiated which is double the actual displacement in azimuth degrees. A signal radiated from the center antenna is used as a reference to eliminate the 180° ambiguity.

3,778,832

POSITION PLOTTING APPARATUS

Eben H. Carruthers, 40 Warren, Warrenton, Oreg.

Filed June 22, 1972, Ser. No. 265,191
Int. Cl. G01s *5/08*
U.S. Cl. 343—112 PT **9 Claims**



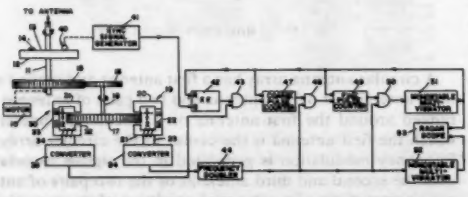
Position-plotting apparatus which may be mounted on and is rotatable with the directional antenna of a radio direction finder. The apparatus includes a mounting bracket which may be secured to the antenna, a chart platform mounted on the bracket for rotation independent of the antenna about an axis coinciding with the rotational axis of the antenna for supporting a chart of a given region, locking shoes for releasably locking the chart platform in a selected position relative to the antenna, and a parallel line overlay overlying the chart platform. The overlay has elongated, parallel straight edges, and is mounted for movement over the chart platform with the straight edges of the overlay being maintained parallel to the directional axis of the antenna, permitting lines paralleling the directional axis of the antenna to be drawn on any part of the chart.

3,778,833

MAGNETIC-ELECTRONIC POSITION ENCODER

Salvatore J. Castrovillo, Marlton, N.J., and Henry A. Smollin, Brooklyn, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 29, 1971, Ser. No. 167,408
Int. Cl. G01s *3/16*
U.S. Cl. 343—118 **2 Claims**



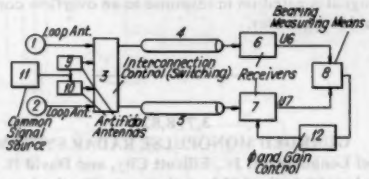
A radar antenna scanning in a horizontal plane is affixed to a rotating shaft. The shaft has in addition a cammed disc and gearwheel mounted to it. The cammed disc actuates a switch at the same azimuth on each revolution of the shaft. The gearwheel forms part of a mechanical coupling driving a magnetic wheel having a plurality of teeth at the outer circumference and a slot inward of the outer circumference. The magnetic wheel forms part of two magnetic circuits that generate separate electrical signals that are converted into pulses. The switch actuates a counting system that counts a predetermined number of known pulses formed from both generated signals to indicate the antenna is pointing in a predetermined direction. A signal is then generated to give such indication.

3,778,834

DIRECTION FINDER CALIBRATION SYSTEM

Dag Poppe, Gjettum, and Gunnar Viggo Odegaard, Simensbraten, both of Norway, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 4, 1972, Ser. No. 250,274
Claims priority, application Norway, May 7, 1971, 1732
Int. Cl. G01s *3/34*
U.S. Cl. 343—119 **8 Claims**



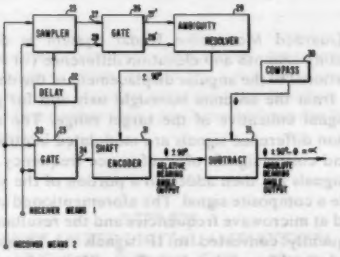
An updating (calibration) system for two channel direction finders comprising two loop antennas and a reference (sense) antenna. Individual receivers connect each of the two loop antennas to bearing measuring means and means are included for updating the gain and phase of the two receivers to equality. Apparatus is also included for interconnecting the input of the two receivers during the updating mode of operation to facilitate calibration (equalization) of the channels. A common signal source which is either the reference (sense) antenna or the one of the two loops having the greatest signal at the time, is applied to both signals through artificial antenna devices which are actually equalizers for calibration purposes.

3,778,835

BEARING DETECTION SYSTEM

Gerson Scharf, Fairfax, Va., assignor to Computer Sciences Corporation, Paramus, N.J.

Filed Apr. 20, 1971, Ser. No. 135,611
Int. Cl. G01s *3/46*
U.S. Cl. 343—113 R **4 Claims**



A system for determining the bearing of aircraft traveling in formation with respect to a master aircraft leading the formation. The master aircraft has a transmitter located thereon while each craft in formation has at least a pair of spaced-

apart receiver means located thereon. If the craft are helicopters, each receiver means of a pair of receiver means is located at the respective end of a rotary blade of the helicopter. If the craft do not have rotary blades the receiver means are stationarily located and successive pairs of receiver means are successively sampled so that with respect to the spaced receiver means the equivalent apparent rotation is achieved. At the time when the signals from the transmitter arrive at both receiver means of a pair of receiver means at the same instant of time it is known that a line from the transmitter to the midpoint of a line connecting the pair of receiver means is perpendicular to the line connecting the pair of receiver means and the bearing is determined.

3,778,836

MAGNETIC ANTENNA HAVING A BLOCK OR CIRCUIT COMPONENTS THEREIN

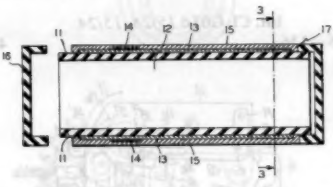
Takashi Tanaka, 340 Oaza Kisaichi, Katano-cho, Kitakawachi-gun, Osaka-fu, Japan

Continuation-in-part of Ser. No. 679,351, Oct. 31, 1967, abandoned. This application Apr. 27, 1971, Ser. No. 137,998

Claims priority, application Japan, Dec. 27, 1966, 41/922; Dec. 28, 1966, 41/10

Int. Cl. H01q *7/08, 1/24*

U.S. Cl. 343—702 **10 Claims**



An antenna for a receiver comprising a magnetic core in the form of a thin layer having a thickness less than 50 microns superposed on a casing of a receiver or on a block of components of the receiver, and a winding wound on said magnetic core and connected electrically to the components in the casing or in the block, the winding serving as the antenna for the receiver. A receiver which comprises said antenna.

3,778,837

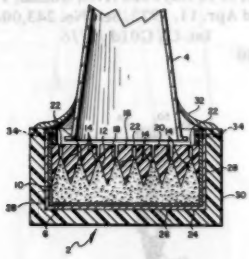
PRECISION CALIBRATION TARGET FOR RADIOMETERS

Walter N. Hardy, Vancouver, B. C., Canada, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 17, 1972, Ser. No. 281,583

Int. Cl. G01s *7/40*

U.S. Cl. 343—703 **3 Claims**



A radiometer reference target comprising a porous mass of microwave absorbing material having lateral dimensions substantially equal to those of the antenna horn of the radiometer to be calibrated having one surface facing said horn configured to minimize microwave radiation, a quantity of fluid whose temperature is accurately known saturating said porous mass, a cap of non-porous microwave transparent material covering said one surface of said porous mass and having one surface configured to mate with and disposed in contiguous relation with said one surface of said porous mass, and shield of microwave reflective material disposed about the other surfaces of said porous mass to retain said fluid within said porous mass. Both method and apparatus are disclosed.

3,778,838

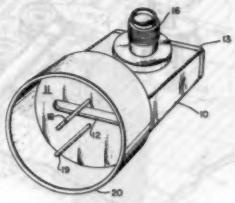
CIRCULAR SYMMETRIC BEAM FORMING APPARATUS

Alvin Clavin, Calabasa, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 1, 1972, Ser. No. 311,210

Int. Cl. H01q *21/00, 13/10*

U.S. Cl. 343—727 **9 Claims**



An antenna is disclosed having an X-section pattern that is circular symmetric, i.e., the antenna produces a beam having equal E and H plane patterns of the type required to achieve circular polarization over a large angular portion of the beam. In general, the antenna is implemented by no less than one slot in a ground plane across the bottom of a conductive cylindrical cup and mutually coupled to and straddled by two dipoles that are normal to the ground plane. In a circularly polarized version of the invention, crossed slots are excited by a rotating electric field.

3,778,839

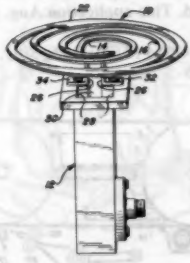
DOUBLE RIDGED WAVE GUIDE FEED FOR SIGNAL ANTENNA

George F. Kovar, Berwyn, Ill., assignor to The Hallicrafters Co., Rolling Meadows, Ill.

Filed July 30, 1971, Ser. No. 167,782

Int. Cl. H01q *1/36*

U.S. Cl. 343—772 **8 Claims**



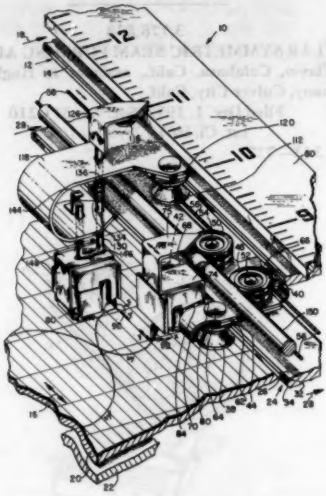
A microwave antenna system comprising a balanced two-arm spiral antenna or pyramidal antenna is directly fed at its center pole by a double ridged wave guide.

3,778,840

DISPOSABLE FIBER TIP MARKER

William R. Dahl, Lakewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 14, 1971, Ser. No. 180,403
Int. Cl. G01d 9/40, 9/30
U.S. Cl. 346—30 8 Claims



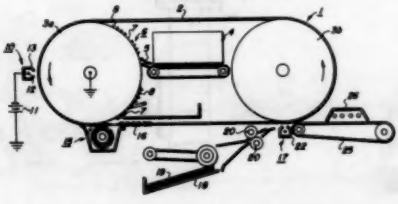
Disposable fiber tip marker means for a flat bed plate type recorder includes first and second markers each comprising a fiber tip pen and cartridge, each cartridge having a flat base wall which is disposed at an angle of 17° with respect to the plane of a recorder chart. The fiber tip pen associated with each cartridge extends at substantially a right angle from the related base wall. Each cartridge also includes a second flat wall which extends at an obtuse angle from said base wall. The cartridges are arranged with each of said second walls disposed in adjacent and parallel planes and with the fiber tip pens thereof extending substantially to said planes whereby each fiber tip pen is capable of recording on substantially the same time line of said chart.

3,778,841

INDUCTION IMAGING SYSTEM

Robert W. Gundlach, Victor, and Richard C. Vock, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 50,763, June 29, 1970, abandoned, which is a continuation-in-part of Ser. No. 697,084, Jan. 11, 1968, abandoned. This application Aug. 9, 1972, Ser. No. 278,892
Int. Cl. G01d 15/06; G03g 5/02, 15/22
U.S. Cl. 346—74 ES 14 Claims



The invention relates to an induction imaging system suitable to accomplish development of an electrostatic latent image at a point remote from the photosensitive surface on which the latent image is originally formed. In one embodiment, an image support member bearing an electrostatic latent image is presented to a self-supporting film in the form of a continuous induction web, an image being thereby induced in the web, developed thereon and subsequently transferred to a receiver material. The continuous induction web may be charged with a negative, positive, ground or alternating potential while in contact with the image support member depending on the polarity of the electrostatic latent image on the image support member; or the continuous web may not be externally charged where only line copy reproduction is desired.

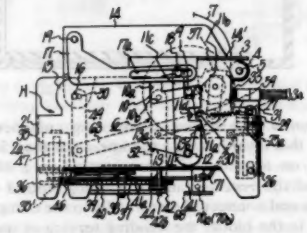
In another embodiment of the invention, an image support member carrying an electrostatic latent image is presented to a receiver material having a bulk resistivity in the range of from about 10^7 to 10^{14} ohm-cm. An electrostatic image is induced in the receiver material, developed thereon and fixed thereto or transferred to a secondary copy sheet material and fixed thereon.

3,778,842

PRINTER

Etsuro Saito, Yokosuka, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sept. 27, 1971, Ser. No. 184,124
Claims priority, application Japan, Sept. 29, 1970, 45/85450
Int. Cl. G01d 15/28, 15/24
U.S. Cl. 346—136 4 Claims



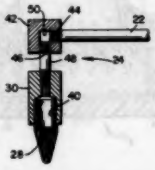
A recording medium is wound on a roller shaft, a feed roller feeds the recording medium in a predetermined direction, a recording head assembly records information signals on the recording medium and a drive mechanism drives the recording head assembly to scan the recording medium. A spring is provided between the roller shaft and the feed roller to urge them to contact each other.

3,778,843

REPLACABLE PEN TIP MOUNTS

Aubrey R. Tullos, 1510 Haywood Ave., Odessa, Tex.

Filed Apr. 11, 1972, Ser. No. 243,004
Int. Cl. G01d 15/16
U.S. Cl. 346—140 11 Claims



Several embodiments of replaceable mounting structures for the pen heads of recording pen systems are disclosed. A pen tip is secured in a mounting chamber which is attached to a capillary ink feed tube through a ink transfer mounting block having inserts for securing the pen tube and the pen tip mounting chamber thereto.

DESIGNS

DECEMBER 11, 1973

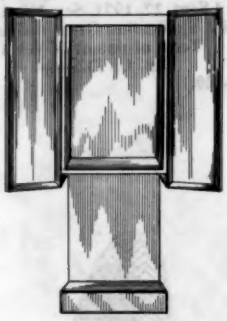
229,522
CANDY RING
Warren A. Parker, Metuchen, N.J., assignor to Ce-De Candy, Inc., Union, N.J.
Filed Sept. 24, 1971, Ser. No. 183,745
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—15

229,523
PANTS
Herman Browdy, 3906 38th St., Brentwood, Md. 20722
Filed May 26, 1972, Ser. No. 257,483
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—28

229,524
SHOE SOLE OR SIMILAR ARTICLE
Aubrey Askew, Southport, England, assignor to Dunlop Limited, Erdington, Birmingham, England
Filed Sept. 27, 1971, Ser. No. 184,314
Claims priority, application Great Britain Mar. 29, 1971
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320

229,525
HAT
Gary Kiyoshi Kobashikawa, 3460 Maluhia St., Honolulu, Hawaii 96816
Continuation of abandoned design application Ser. No. 161,402, July 12, 1971. This application Nov. 30, 1972, Ser. No. 310,841
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—250

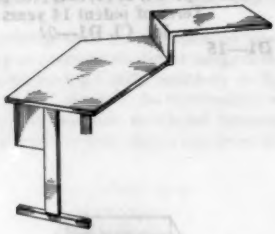
229,526
LOUDSPEAKER DISPLAY FIXTURE
William R. Saidel, Olympia Fields, Ill., assignor to Electronic Industries Incorporated, South Holland, Ill.
Filed Sept. 20, 1971, Ser. No. 182,292
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—20



229,527
CHAIR
Gordon L. Duern and Donald S. Griffin, Kitchener, Ontario, Canada, assignors to Electrohome Limited, Kitchener, Ontario, Canada
Filed May 19, 1971, Ser. No. 145,093
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—69

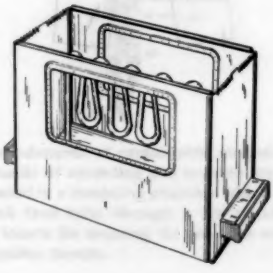
229,528
ICE CREAM DISPLAY CABINET
Bernard L. Rothbardt, Sherman Oaks, Calif., assignor to Baskins-Robbins Inc., Burbank, Calif.
Filed Sept. 3, 1971, Ser. No. 177,927
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—168

229,529
DESK
Frank Gallagher, Manhasset, and Gordon Perry, Bayside, N.Y., assignors to Oxford Pendaflex Corporation, Garden City, N.Y.
Filed Apr. 17, 1972, Ser. No. 245,015
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



229,530
COFFEE MAKER
Oscar Strother Simpson, Jr., Houston, Tex., assignor to Toddy Products Inc., Houston, Tex.
Filed Nov. 11, 1971, Ser. No. 198,034
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—41

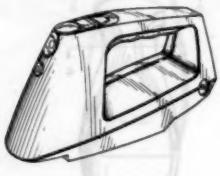
229,531
ELECTRIC BARBECUE UNIT
Jean Mantelet, Paris, France, assignor to Moulinex, Societe Anonyme, Bagnolet, France
Filed Nov. 3, 1972, Ser. No. 303,426
Claims priority, application France June 26, 1972
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—110



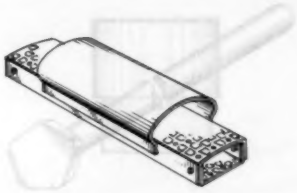
229,532
MICROWAVE OVEN BROILER RACK
Albert E. Colato, St. Paul, and Peter Newman Daly, Minneapolis, Minn., assignors to Litton Systems, Inc., Beverly Hills, Calif.
Filed Mar. 5, 1973, Ser. No. 337,809
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—136

229,533
KNIFE
James F. Pugh, Sr., 917 Carpenter St., Azle, Tex. 76020
Filed Aug. 23, 1972, Ser. No. 283,073
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—144

229,534
HOUSING FOR GRASS SHEARS OR THE LIKE
Stephen K. Lauderback, Elmhurst, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Oct. 11, 1972, Ser. No. 296,715
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—8

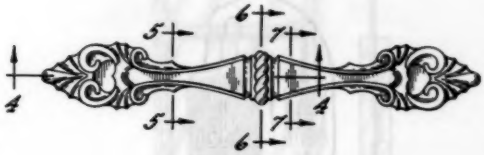


229,535
HALF-ROUND FLAT, HOLLOW FILE
Elwin Theobald, 4631 Solano Way, Fair Oaks, Calif. 95628
Filed Dec. 2, 1971, Ser. No. 204,392
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—90



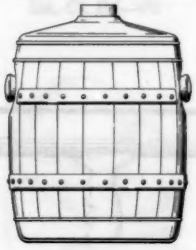
229,536
PORTABLE CUTTING TORCH
Donald C. Bonk, San Jose, Calif., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Sept. 15, 1971, Ser. No. 180,942
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—98

229,537
PULL
Laverne E. Clayton, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Aug. 1, 1972, Ser. No. 277,104
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—166

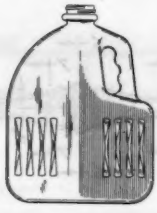


229,538
HEAD FOR CONCRETE FORM TIE RODS
William J. Steffan, Fremont, Calif., assignor to Burke Concrete Accessories, Inc., Burlingame, Calif.
Filed July 6, 1971, Ser. No. 160,270
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—228

229,539
BOTTLE
Peter L. Schweizer, Liberty Center, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed July 3, 1972, Ser. No. 268,483
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—28



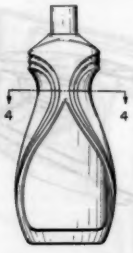
229,540
JUG
Victor F. Anderson, 13 W. Mantua Ave., Wenonah, N.J. 08090
Filed Feb. 7, 1972, Ser. No. 224,407
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—40



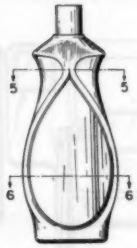
229,541
JUG
Victor F. Anderson, 13 W. Mantua Ave., Wenonah, N.J. 08090
Original design application Feb. 7, 1972, Ser. No. 224,407. Divided and this application Jan. 23, 1973, Ser. No. 326,229
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—40

229,542
BOTTLE
Peter L. Schweizer, Liberty Center, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Aug. 7, 1972, Ser. No. 278,369
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—59

229,543
BOTTLE
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Aug. 14, 1972, Ser. No. 280,153
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—115

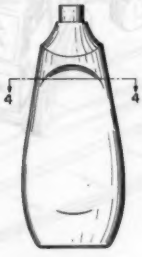


229,544
BOTTLE
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Sept. 15, 1972, Ser. No. 289,681
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—115

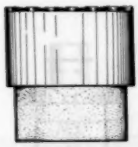


229,545
BOTTLE
Albert R. Uhlig, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Dec. 15, 1971, Ser. No. 208,514
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—140

229,546
BOTTLE
James E. Plummer, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed June 28, 1972, Ser. No. 267,191
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—143

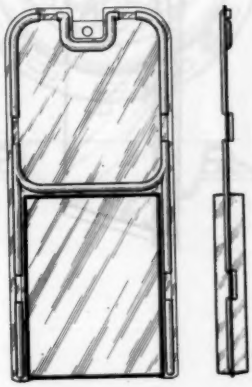


229,547
BOTTLE
Kenji Hanamura, Tokyo, Japan, assignor to Tancho Co., Ltd., Higashi-ku, Osaka, Japan
Original design application Dec. 31, 1970, Ser. No. 26,716. Divided and this application Oct. 14, 1971, Ser. No. 189,481
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—157



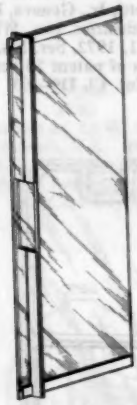
229,548
CONTAINER FOR LIQUIDS
Arnold H. Kranz, Chicago, Ill., assignor to Helene Curtis Industries, Inc., Chicago, Ill.
Filed Aug. 12, 1971, Ser. No. 171,414
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—169

229,549
CASSETTE DISPLAY PACKAGE OR THE LIKE
Joseph A. Mascetti, Jr., Geneva, Ill., assignor to Plastofilm Industries, Inc., Wheaton, Ill.
Filed Feb. 1, 1972, Ser. No. 222,712
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—182



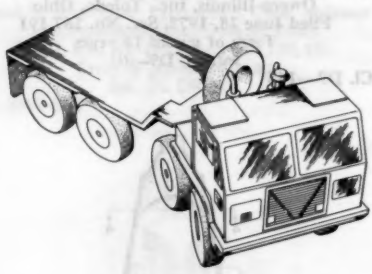
229,550
BOX
Karen G. Heller, 162 Hamilton Road, Rockville Centre, N.Y. 11570
Filed Oct. 4, 1971, Ser. No. 186,592
Term of patent 3½ years
Int. Cl. D9—*03*
U.S. Cl. D9—198

229,551
DOOR
William J. Horgan, Jr., 1299 Folkstone Drive, Pittsburgh, Pa. 15216
Original design application June 1, 1970, Ser. No. 23,254. Divided and this application June 17, 1971, Ser. No. 154,248
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1 M



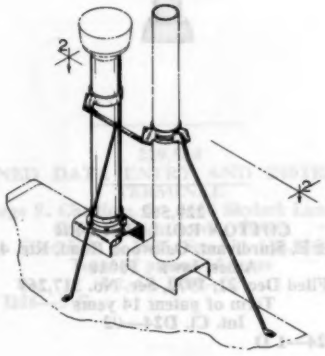
229,552
POST
William J. Horgan, Jr., 1299 Folkstone Drive, Pittsburgh, Pa. 15216
Original design application July 2, 1969, Ser. No. 18,032, now Patent No. 220,476. Divided and this application Oct. 13, 1970, Ser. No. 25,472
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—7

229,553
ARTICULATED ALL TERRAIN VEHICLE
Henry A. Ford, San Jose, and David R. Fleming and James F. King, Cupertino, Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.
Filed Aug. 11, 1971, Ser. No. 171,044
Term of patent 14 years
Int. Cl. D12—*09, 10*
U.S. Cl. D14—3 J

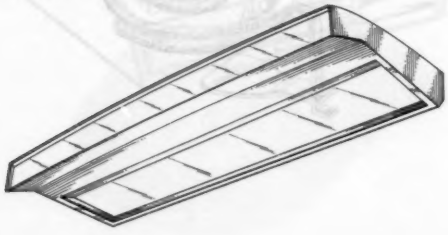


229,554
DEMOUNTABLE PERSONNEL CAB FOR PICKUP TRUCKS
Jack T. Bell, 16304 SE. 16th St., Vancouver, Wash. 98664
Filed Sept. 17, 1971, Ser. No. 181,648
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—3 J

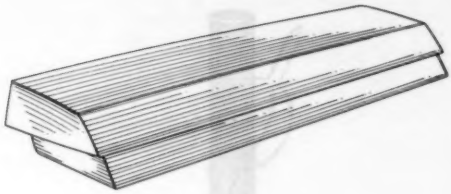
229,555
AIR CLEANER STACK ASSEMBLY AND MOUNT FOR TRACTORS
Andy M. Rustemeyer, Rte. 1, Box 18, Creston, Wash. 99117
Filed Nov. 19, 1971, Ser. No. 200,659
Term of patent 3½ years
Int. Cl. D12—*09*
U.S. Cl. D14—6 A



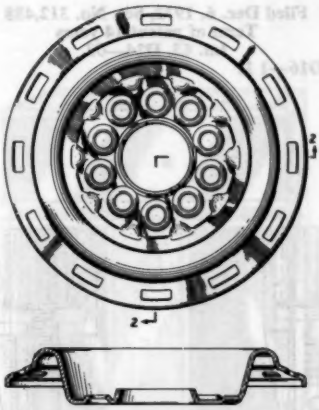
229,556
PERISCOPE-TYPE REARVIEW MIRROR
Lynn Harold Hodge, 841 McNichols W., Highland Park, Mich. 48203
Filed Apr. 6, 1970, Ser. No. 22,263
Term of patent 3½ years
Int. Cl. D12—*14*
U.S. Cl. D14—6 M



229,557
PERISCOPE-TYPE REARVIEW MIRROR
Lynn Harold Hodge, 841 McNichols W., Highland Park, Mich. 48203
Filed Apr. 6, 1970, Ser. No. 22,267
Term of patent 3½ years
Int. Cl. D12—*14*
U.S. Cl. D14—6 M

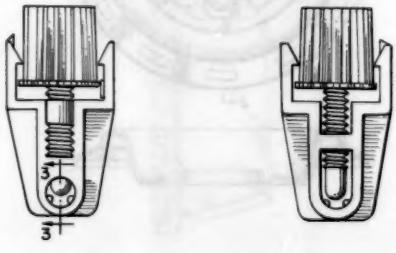


229,558
SPIDER FOR A WHEEL
James L. Brainard, 6237 Kauffman Ave., Temple City, Calif. 91780, and Robert J. Palm, 18297 Midbury, Brea, Calif. 92621
Continuation-in-part of abandoned design application Ser. No. 191,579, Oct. 21, 1971. This application June 15, 1972, Ser. No. 262,948
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—30 R



229,559
MOLTEN METAL SAMPLING TUBE
Rudolph J. Palme, Hamilton, Ontario, Canada, assignor to Evacuo Enterprises Limited, Hamilton, Ontario, Canada
Filed Mar. 12, 1971, Ser. No. 123,934
Term of patent 14 years
The portion of the term of the patent subsequent to May 5, 1984, has been disclaimed
Int. Cl. D24—*02*
U.S. Cl. D16—1

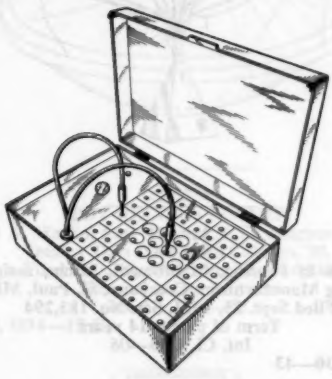
229,560
FLOW CONTROL CLAMP
George K. Burke and Kenneth Raines, Bethlehem, Pa., assignors to Burron Medical Products, Inc., Bethlehem, Pa.
Filed Dec. 6, 1972, Ser. No. 312,488
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D16—1 R



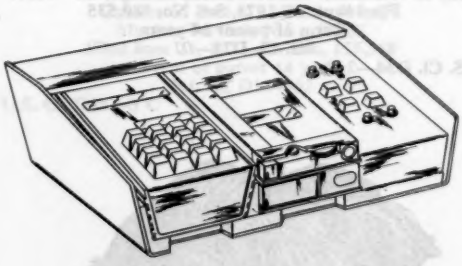
229,561
COMBINATION FLUSH VALVE AND CONTROL VALVE
James A. Sloan, River Forest, and Axel B. Nelson, Mount Prospect, Ill., assignors to Sloan Valve Company
Filed Mar. 8, 1971, Ser. No. 122,257
Term of patent 14 years
The portion of the term of the patent subsequent to July 14, 1984, has been disclaimed
Int. Cl. D23—*01*
U.S. Cl. D23—38

229,562
COTTON ROLL HOLDER
Jack E. Sturdivant, Oakwood Road, Rte. 4, Ames, Iowa 50010
Filed Dec. 21, 1972, Ser. No. 317,269
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—1 D

229,563
EDUCATIONAL DEVICE
Harold C. Sirkin, Wayne, and Ernest Sirkin, Edison, N.J., assignors to Educational Progress, Inc., Wayne, N.J.
Filed Dec. 23, 1971, Ser. No. 211,489
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D25—1 R

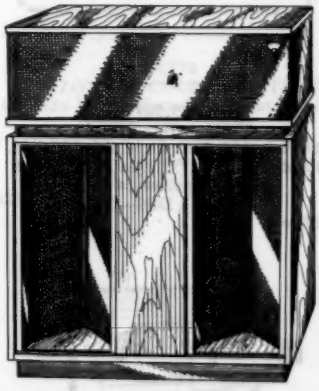


229,564
COMBINED DATA ENTRY AND DISTRIBUTION TERMINAL
George E. Chadima, Jr., 3624 Skylark Lane SE., Cedar Rapids, Iowa 52403
Filed Feb. 4, 1971, Ser. No. 112,836
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

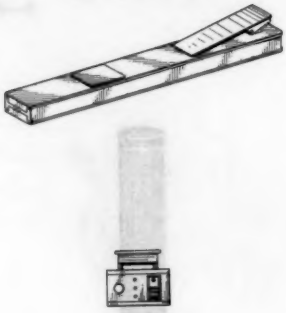


229,565
BAFFLED LOUD-SPEAKER
Charles Legorju, Montreuil, France, assignor to Societe Audax, Montreuil, France
Filed Mar. 10, 1972, Ser. No. 233,860
Claims priority, application France Sept. 14, 1971
Term of patent 7 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G

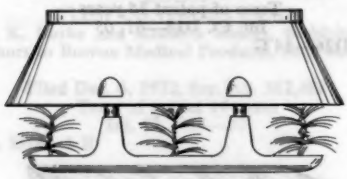
229,566
LOUDSPEAKER CABINET
Paul W. Klipsch, Hope, Ark., assignor to Klipsch and Associates, Inc., Hope, Ark.
Filed Oct. 12, 1971, Ser. No. 188,660
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D26—14 G



229,567
RADIO PAGER OR SIMILAR ARTICLE
Arnold S. Goldman and Donald K. Krumin, Fort Lauderdale, Fla., assignors to Motorola, Inc., Franklin Park, Ill.
Filed Aug. 4, 1971, Ser. No. 169,157
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 K

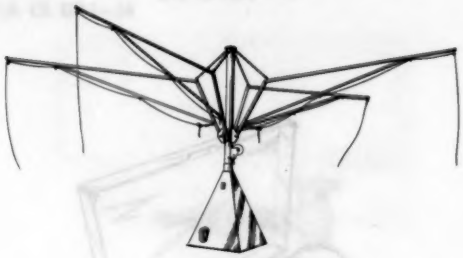


229,568
SAFETY ENCLOSURE FOR YOUNG FISH
Allan H. Willinger, New Rochelle, N.Y., assignor to Metaframe Corporation, Maywood, N.J.
Filed Apr. 6, 1972, Ser. No. 241,881
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—6

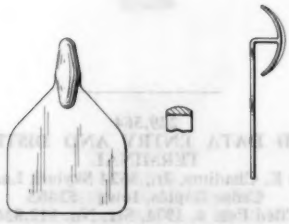


229,569
FISH AQUARIUM
Gary L. Anielak, 325 Buck St., Collinsville, Ill. 62234
Filed Apr. 10, 1972, Ser. No. 242,888
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—9

229,570
HORSE WALKER
Bennie J. Johnson, 16046 Maplegrove, La Puente, Calif. 91744
Filed Mar. 31, 1972, Ser. No. 240,330
Term of patent 14 years
Int. Cl. D30—*07*
U.S. Cl. D30—42

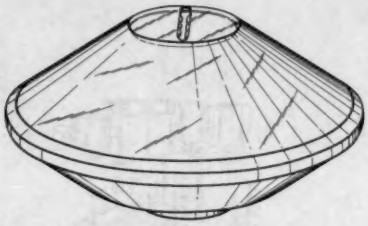


229,571
EAR TAG
Donald David Fearing, Mahtomedi, Minn., assignor to Fearing Manufacturing Company, St. Paul, Minn.
Filed Sept. 23, 1971, Ser. No. 183,294
Term of patent 14 years
Int. Cl. D30—*08*
U.S. Cl. D30—43

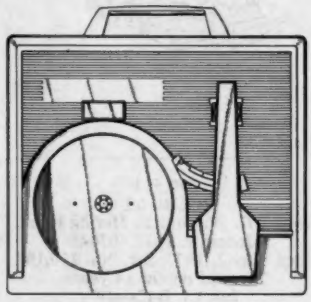


229,572
TOY DOG
Betty Jo Gonzalez, 5426 S. Wolcott, Chicago, Ill. 60609
Filed Sept. 14, 1971, Ser. No. 180,535
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R

229,573
SAVINGS BOX
Heikki Travela, 12 Arinatie, 00370 Helsinki 37, Finland
Filed Dec. 28, 1971, Ser. No. 213,240
Claims priority, application Finland July 2, 1971
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—11 R

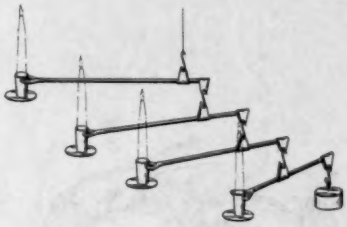


229,574
TOY RECORD PLAYER
Paul A. Martin, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 30, 1971, Ser. No. 214,532
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 C

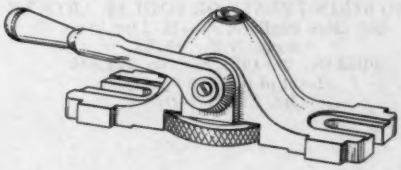


229,575
FLOWER POT HOLDER
Charles G. Dallas, 108 Broadway, Mantua Terrace, N.J. 08051
Filed June 21, 1971, Ser. No. 155,380
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 C

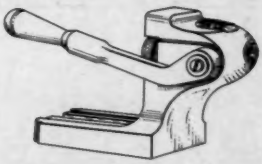
229,576
CANDLE CHANDELIER MOBILE
Edwin T. Blake, East Fishkill, N.Y. (Rte. 376, Hopewell Junction, N.Y. 12533)
Filed Feb. 14, 1972, Ser. No. 226,388
Term of patent 14 years
Int. Cl. D26—*01;* D11—*02*
U.S. Cl. D48—2



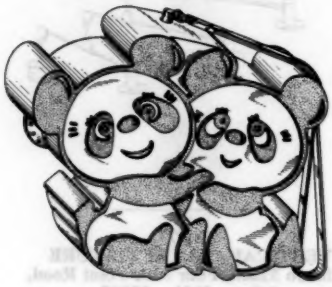
229,577
VERTICAL COLLET FIXTURE
Orlando Mileti, Four Mile Point Road, Athens, N.Y. 12015
Filed May 3, 1971, Ser. No. 140,022
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D54—4



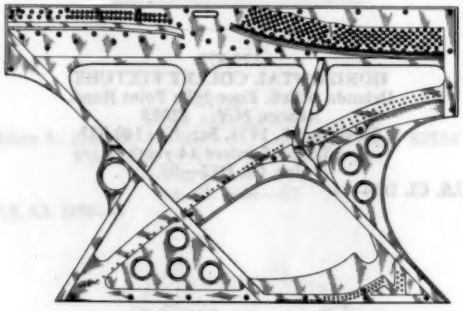
229,578
HORIZONTAL COLLET FIXTURE
Orlando Mileti, Four Mile Point Road, Athens, N.Y. 12015
Filed May 3, 1971, Ser. No. 140,023
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D54—4



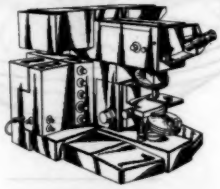
229,579
RADIO
Morris Fink, Great Neck, N.Y., assignor to Windsor Industries, Inc., Plainview, N.Y.
Filed Dec. 11, 1972, Ser. No. 313,830
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



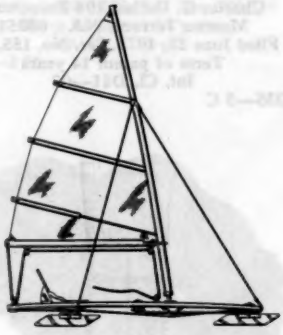
229,580
PIANO STRING PLATE OR SIMILAR ARTICLE
Salvatore Pagliaro, 21—16 21st Ave., Astoria, N.Y. 11105
Filed Oct. 26, 1971, Ser. No. 192,693
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D56—9



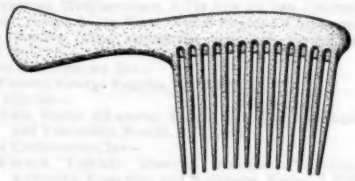
229,581
MICROSCOPE
John T. Armbruster, Niagara Falls, N.Y., and Adolf Kenzian, Vienna, Austria, assignors to American Optical Corporation, Southbridge, Mass.
Filed Mar. 26, 1973, Ser. No. 345,048
Term of patent 14 years
Int. Cl. D16—*08*
U.S. Cl. D57—1 E



229,582
ICEBOAT
Robert D. Wotton, 28 Hering Road, Montvale, N.J. 07645
Filed May 3, 1972, Ser. No. 250,102
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D71—1 BB

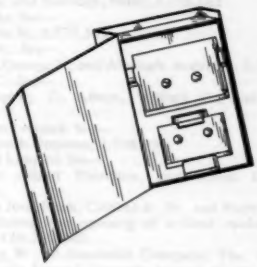


229,583
COMB
Franklin De Heart Harvey, 100 E. Broad St., Richmond, Va. 23219
Filed June 29, 1972, Ser. No. 267,687
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—8

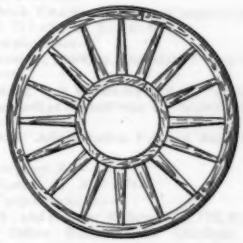


229,584
BOOTJACK
Elmer O. Billingslea, Jr., Salina, Okla. 74365
Filed July 18, 1972, Ser. No. 272,893
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D86—10 D

229,585
PACKAGING CONTAINER FOR AUDIO-VISUAL CASSETTES
Alan R. Singleton, Croton-on-Hudson, N.Y., assignor to North American Philips Corporation, New York, N.Y.
Filed June 24, 1971, Ser. No. 156,578
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 D



229,586
HOLDER FOR A TOKEN COIN
Donald J. Frost, 2506 W. Crescent, Racine, Wis. 53403
Filed June 7, 1971, Ser. No. 150,886
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—3 B



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TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF DECEMBER, 1973

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AB Bahco Ventilation: *See—*
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Adair, Leonard T. Swimming pool user warning system. 3,778,804, Cl. 340-272.000.

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Adams, Michael L. Shrimp cleaning device. 3,777,333, Cl. 17-72.000.

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Allport, Davies. Irrigation pitting. 3,777,980, Cl. 239-272.000.

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Amchem Products, Inc.: *See—*
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Andow, Paul; Guillen, David; and Diaz, Raul G. Walker with adjustable crutch head supports. 3,778,052, Cl. 272-70.400.

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Auto-Place, Inc.: *See—*
Potter, Ronald, 3,777,902.

Automation Industries, Inc.: *See—*
Fairchild, Wayne K., 3,778,327.

Automobile Peugeot: *See—*
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Avco Corporation, mesne: *See—*
Bass, Harland A.; and Faroudja, Yves C., 3,778,718.

Axen, Udo F., to Upjohn Company, The. Certain bicyclic lactones. 3,778,450, Cl. 260-343.300.

Ayerst, McKenna and Harrison Limited: *See—*
Jirkovsky, Ivo; Humber, Leslie G.; Demerson, Christopher A.; and Dobson, Thomas A., 3,778,449.

B. & W. Manufacturing Co. Inc., mesne: *See—*
Boser, Ronald J., 3,777,314.

B/K Electric Co., Inc.: *See—*
Burch, Lyndon W., 3,778,739.

Babcock, David L.: *See—*
Metzger, Lenard M.; and Babcock, David L., 3,778,545.

Baccaglini, Russell C.; and Rogers, Kenneth J., to Ocean Recovery Systems, Inc. Latent buoyancy system. 3,777,692, Cl. 114-54.000.

Back, Paul: *See—*
Weatherly, Gilbert L.; and Back, Paul, 3,777,538.

Badische Anilin- & Soda-Fabrik Aktiengeselischaft: *See—*
Hild, Willi; Zahradnik, Franz; Zahn, Erwin; and Priebe, Edmund, 3,778,407.
Krauch, Carl Heinrich; and Sanner, Axel, 3,778,294.
Mueller, Herbert; and Goetz, Norbert, 3,778,477.
Sturm, Hans-Juergen; and Tritschler, Claus, 3,778,448.

Baer, Stephen C., to Operations Analysis Inc. Construction toy. 3,777,393, Cl. 46-25.000.

Baier, John P. Plug having independent axial and lateral compression means. 3,778,539, Cl. 174-152.00r.

Bain, James A., to General Electric Company. Strain-leaf burr height detector. 3,777,558, Cl. 73-105.000.

Bajars, Laimonis: *See—*
Croce, Louis J.; and Bajars, Laimonis, 3,778,488.

Baker, Dale A.; and McCarthy, John M., to Cutler-Hammer, Inc. Tape controlled order picking system. 3,777,910, Cl. 214-16.00b.

Baker, Jesse Lee, to American Cyanamid Company. Isolation of prostaglandins from plexaura homamalla. 3,778,469, Cl. 260-499.000.

Baker, Richard D.; Hayter, Sidney W.; and Lewis, Homer D., to United States of America, Atomic Energy Commission. Method for producing UO_2 loaded refractory metals. 3,778,380, Cl. 252-301.10r.

Baker, William J., to Armco Steel Corporation. Ball valve. 3,778,029, Cl. 251-315.000.

Ball Brothers Research Corporation: *See—*
Roller, Kent G.; Ahlborn, George H.; and Brown, Richard E., 3,778,308.

Balston, William J., to EG&G, Inc. Capacitive intrusion detection system with balanced resonant circuits. 3,778,807, Cl. 340-258.00c.

Bamberg, George. Pump for parenteral injections and the like. 3,778,195, Cl. 417-474.000.

Bamser, Frank G., Jr.: *See—*
Rohrbaugh, George W.; and Bamser, Frank G., Jr., 3,778,059.

Bandukwalla, Phiroze, to General Motors Corporation. Radial diffuser. 3,778,186, Cl. 415-181.000.

Banigan, Thomas F.: *See—*
Morrisroe, John J.; and Banigan, Thomas F., 3,778,479.
Morrisroe, John J.; and Banigan, Thomas F., 3,778,482.

Barber, Claude L., to Yaun Manufacturing Company, Inc. Material handling implement. 3,777,918, Cl. 214-138.00r.

Barber-Colman Company: *See—*
Aumiller, Clyde F.; Morrison, Lowell D.; and Holinbeck, Dale G., 3,777,742.

Barcus, Jack L.; Kilroy, Eugene J., Jr.; Morin, Marius J.; and Parker, John C., to Mattel, Inc. Simplified toy launcher. 3,777,391, Cl. 46-1.00k.

Bardot, Ernest Roger. Method of making skeletal tetrahedrons. 3,777,359, Cl. 29-463.000.

Barlow, Charles Brian; and Tomlin, Clive Dudley Spencer, to Imperial Chemical Industries Limited. Chemical compounds and compositions. 3,778,437, Cl. 260-256.40n.

Barnes Drill Co.: *See—*
Estabrook, Mark R., 3,777,788.

Barnes, John V., to Ford Motor Company. Rear suspension system for a motor vehicle. 3,777,838, Cl. 180-71.000.

Barnes, Ronald B., to Du Pont de Nemours, E. I., and Company, mesne. Terminal applicator. 3,777,349, Cl. 29-203.000.

Barnett, Erwin M.: *See—*
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Barnhart, James H.: *See—*
Gambs, Gerard C.; Nix, William H.; Barnhart, James H.; and Cathcart, John G., 3,778,239.

Barnstorf, Joachim, to Henkel & Cie G.m.b.H. Process for the production of hydroxy-fatty acid esters. 3,778,465, Cl. 260-409.000.

Barratt, William C. Apparatus for producing cement sheets. 3,778,206, Cl. 425-86.000.

Barron, Ellis. Flectrum operating means. 3,777,612, Cl. 84-258.000.

Barteck, Werner W., to Rehkopf Industries, Inc. Locking material-handling tray. 3,777,885, Cl. 206-72.000.

Baruffa, Olindo, to Mefina S.A. Sewing machine. 3,777,685, Cl. 112-220.000.

Bass, Harland A.; and Faroudja, Yves C., to Avco Corporation, mesne. Modulation system. 3,778,718, Cl. 325-139.000.

Battelle Memorial Institute: *See—*
Mallozzi, Philip J.; Epstein, Harold M.; Walters, Craig T.; Applebaum, David C.; and Gallagher, William J., 3,778,585.

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Ginaven, Marvin E., 3,777,893.

Bauer, Lowell W.: *See—*
Area, Manuel; and Bauer, Lowell W., 3,778,825.

Bauer, Lowell W., to General Electric Company. Sum-rank normalized detection apparatus. 3,778,822, Cl. 343-5.00r.

Bauer, Paul, Jr., to Owens-Illinois, Inc. Apparatus and method for controlling a centrifugal compressor. 3,778,695, Cl. 318-481.000.

Baumann, Bernard: *See—*
Doucerain, Jacques; and Baumann, Bernard, 3,778,017.

Bausch & Lomb, Incorporated: *See—*
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Bayati, Abutorab, to Siemens Aktiengesellschaft. Method and apparatus for analog-digital conversion. 3,778,812, Cl. 340-347.0nt.

Bayer Aktiengesellschaft: *See—*
Bockmann, August; Trenczek, Gerhard; Rudolph, Hans; Wiegreffe, Wolfgang; and Ritter, Wolfgang, 3,778,289.
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Schubart, Rudiger; Eholzer, Ulrich; Kempermann, Theo; and Roos, Ernst, 3,778,419.
Wiechers, Herbert; and Heikaus, Reinhard, 3,778,362.

Bayley, Donald S.; Greenwood, Ivan A., Jr.; and Simpson, James H., Jr., to Singer-General Precision, Inc. Optically pumped nuclear magnetic resonance gyroscope. 3,778,700, Cl. 324-.50r.

Beall, William George. Marine elevator. 3,777,691, Cl. 114-48.000.

Beard, Hoyt S., to Reynolds, R. J., Tobacco Company. Method for manufacturing jet impingement type filters for smoking articles. 3,778,328, Cl. 156-215.000.

Beaston, Bud A. Device for locating sore spots on horse hooves. 3,777,741, Cl. 128-2.000.

Beaver, Donald V.: *See—*
Driscoll, Richard P.; Lannert, James W.; and Beaver, Donald V., 3,778,014.

Beck, Charles, Machines Corporation: *See—*
Allen, Philip, 3,777,455.

Beck, Maurice E., to Kunkle Valve Co., Inc. Valve and method of making the same. 3,777,783, Cl. 137-625.500.

Becker, Joseph J.; Schulte-Elte, Karl-Heinrich; and Ohloff, Gunther, to Firmenich S.A., mesne. Methods for the manufacture of macrocyclic compounds. 3,778,483, Cl. 260-666.0py.

Becker, Otto Alfred. Resistance welding of sheet metal coated with layers. 3,778,583, Cl. 219-91.000.

Becker, Philipp: *See—*
Lindsay, Anthony; Imperati, Ronald Lee; and Becker, Philipp, 3,778,202.

Becker, Roger T.; Hatter, Stephen L.; and McMullin, Donald, Jr., to Kalamazoo Conveyor Company. Plow harpoon-type conveyor. 3,777,880, Cl. 198-221.000.

Beckman Instruments, Inc.: *See—*
Chervenka, Charles Henry, 3,778,171.

Beddoe, George H.: *See—*
Gannon, Charles R.; and Beddoe, George H., 3,778,397.

Beer, Henri Bernard, to Chemnor Corporation. Electrode and coating therefor. 3,778,307, Cl. 117-221.000.

Belitz, Fritz; and Bender, Karl-Richard, to Minox GmbH. Device for feeding exposure values to apparatus including photoelectric exposure meters and control devices. 3,777,635, Cl. 95-10.0ct.

Bell & Howell Company: *See—*
McClure, Richard J., 3,778,145.
Robbins, Harry, 3,778,373.

Bell Canada-Northern Electric Research Limited: *See—*
Hood, David Frederick, 3,778,773.
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Bell, Robert E.: *See—*
Huelsman, Gregory J.; Bell, Robert E.; and Rohe, Gerald Edward, 3,778,395.

Bell Telephone Laboratories, Incorporated: *See—*
Bobeck, Andrew Henry; Copeland, John Alexander, III; and Wolfe, Raymond, 3,778,788.
Courtney-Pratt, Jeofry Stuart, 3,778,361.
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Frame, Robert Michael Gray, 3,778,642.

Bellinger, James E.: *See—*

MacNeill, John H.; Bellinger, James E.; Lidkea, Harrison B.; and Seib, Kenneth L., 3,777,417.
Bendayan, Jacques, to Cables de Lyon-Alsacienne-Geoffroy. Safety device for pipe lines under gas pressure. 3,778,799, Cl. 340-235.000.
Bender, Emil A. Pumping and servicing rig. 3,777,491, Cl. 60-372.000.
Bender, Karl-Richard: *See*—
Belitz, Fritz; and Bender, Karl-Richard, 3,777,635.
Bendix Corporation, The: *See*—
Moore, Robert G., Jr., 3,777,478.
Needham, James M., 3,778,117.
Bendler, Hellmut: *See*—
Gawlick, Heinz; Bendler, Hellmut; and Jensen, Ernst, 3,777,664.
Benjamin, John Stanwood, to International Nickel Company, Inc., The. Dispersion strengthened electrical heating alloys by powder metallurgy. 3,778,249, Cl. 75-5.0bc.
Benziger, Theodore M., to United States of America, Atomic Energy Commission. High-energy plastic bonded explosive. 3,778,319, Cl. 149-92.000.
Berg Electronics, Inc.: *See*—
Marks, Richard L., 3,778,755.
Bergantzel, Richard P.: *See*—
Haley, David M.; and Bergantzel, Richard P., 3,777,326.
Berger, Abe; and Selin, Terry G., to General Electric Company. Sylyl maleates and polysiloxane maleates. 3,778,459, Cl. 260-448.20n.
Bergmeyer, Hans Ulrich; Bernt, Erich; Gruber, Wolfgang; Schmidt, Felix Helmut; and Stork, Harald, to Boehringer Mannheim Gesellschaft mit beschrankter Haftung. Diagnostic agent and method for determining glucose. 3,778,350, Cl. 195-103.50c.
Bergsten, Mary E.; and Bergsten, Ralph A. Sports pocket for wearing apparel. 3,777,313, Cl. 2-247.000.
Bergsten, Ralph A.: *See*—
Bergsten, Mary E.; and Bergsten, Ralph A., 3,777,313.
Bernard, Pierre James, to Esso Research and Engineering Company. Synthetic carboxylic acids of high molecular weight. 3,778,455, Cl. 260-413.000.
Bernasconi, Raymond, to Ciba-Geigy Corporation. α-(1,2,3,4-Tetrahydro-6-quinolyl)-carboxylic acids and derivatives thereof for treating inflammation. 3,778,511, Cl. 424-258.000.
Berndt, Hartmut: *See*—
Doll, Robert; and Berndt, Hartmut, 3,778,122.
Bernsmann, Gert P., to Jones & Laughlin Steel Corporation. Method for treating metallic melts. 3,778,250, Cl. 75-58.000.
Bernstein, Frank: *See*—
Hueschen, Robert E.; and Bernstein, Frank, 3,778,654.
Bernt, Erich: *See*—
Bergmeyer, Hans Ulrich; Bernt, Erich; Gruber, Wolfgang; Schmidt, Felix Helmut; and Stork, Harald, 3,778,350.
Bernu, John M., to Timesavers, Inc. Wide belt sanding machine with improved support for outboard end of cantilevered center bar. 3,777,442, Cl. 51-135.00r.
Berriman, Lester P.: *See*—
Eversole, James F.; and Berriman, Lester P., 3,778,038.
Bertozzi, Eugene R., to Thiokol Chemical Corporation. Process for preparing polythiodiglycol. 3,778,478, Cl. 260-608.000.
Best, Donald Edward, to Levellers, A. M., and I., Ltd. Automatic device for trimming vessels. 3,777,694, Cl. 114-126.000.
Betts, Max William; and Robinson, Frank, to Courtaulds Limited. Knitted garment panel. 3,777,511, Cl. 66-76.000.
Bhagawan, Venkatesha S.; Jones, Richard A.; McDowell, Allen W.; Mine, George D.; Remsburger, Louis J.; Rupp, Bruce A.; and Whittaker, Rodney R., to International Business Machines Corporation. Keyboard with four character set shift. 3,778,819, Cl. 340-365.0s.
Biblarz, Oscar, to United States of America, Navy. Electrogasdynamic spectral anemometer. 3,777,564, Cl. 73-194.00f.
Bien, Hans-Samuel: *See*—
Kuth, Robert; Hildebrand, Dietrich; and Bien, Hans-Samuel, 3,778,228.
Bierwith, Stanton F., to Great Canadian Oil Sands, Limited. Method of providing alloyed zones on a hard faced workpiece. 3,778,580, Cl. 219-73.000.
Bilbrey, Robert A., to West, Benjamin W.; d/b/a California Controls Company. . 3,777,696, Cl. 116-114.500.
Bilco, Arthur, to Raymond Corporation, The. Lift truck load wheel arrangement. 3,778,080, Cl. 280-104.50r.
Biller, Efim; Goller, Roman; Pflugk, Hellmuth; and Schlegel, Richard, to Union Rheinische Braunkohlen Kraftstoff Aktiengesellschaft. Process for the production of alkyl dihydroxy benzenes. 3,778,481, Cl. 260-629.000.
Billester, Henry R., to Sloan Valve Company. Operating arrangement for flush valves. 3,778,023, Cl. 251-30.000.
Billi, G., & C., S.p.A.: *See*—
Conti, Paolo, 3,777,513.
Billmann, Gerhard Leonhard Emil: *See*—
Stieler, Alfred Otto Hugo; and Billmann, Gerhard Leonhard Emil, 3,777,926.
Bilow, Norman, to United States of America, Air Force. Process for preparing a polyphenylene lacquer and laminates fabricated therewith. 3,778,405, Cl. 260-33.80r.
Binard, William J.; and Dye, John F., to Kendall Company, The. Endometrical sampler. 3,777,743, Cl. 128-2.00b.
Biondo, Nunzio, to Italsider, Societa per Azioni. Self-locking for loop chains. 3,777,477, Cl. 59-93.000.
Birch, Fernando Francis: *See*—
Poenisch, Richard Bruce; and Birch, Fernando Francis, 3,778,382.
Birckhead, Lennox, 1/2 to Air Products and Chemicals, Inc. and 1/2 to Scott Paper Company, mesne. Powder deposition system. 3,777,874, Cl. 198-56.000.
Birge, William T.: *See*—
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Birkendahl, Karl: *See*—
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Birmingham Small Arms Company Limited, The: *See*—
Taylor, Richard Alan, 3,778,231.
Bise, Donald L.; and Surprenant, Ronald J., to Lear Siegler, Inc. Voice frequency repeater. 3,778,563, Cl. 179-170.00r.
Bishel, Robert Anthony, to International Nickel Company, Inc., The. Self-shielding cored wire to weld cast iron. 3,778,588, Cl. 219-146.000.
Bishop, Robert C.; Fekete, Lajos F.; and Shanbrom, Edward, to Baxter Laboratories, Inc. Plasminogen assay system. 3,778,352, Cl. 195-99.000.
Bisset, Douglas Chisholm; and Pugh, Kenneth Mervyn, to Imperial Chemical Industries Limited. Apparatus for the manufacture of eccentric core/shell conjugate filaments. 3,778,208, Cl. 425-131.000.
Bixby Box Toe Co., Inc.: *See*—
Trask, Blair D., 3,778,251.
Blackwell, Lyman L.; and Staby, Paul A., to Statitrol Corporation. Self-monitoring battery operated circuit. 3,778,800, Cl. 340-249.000.
Blanchet, Pierre: *See*—
Recasens, Joseph; Blanchet, Pierre; and Duchenoy, Jacques, 3,777,805.
Blaschek, Otto. Intermittent movement for feeding film. 3,777,961, Cl. 226-57.000.
Blazey, Lawrence; Silverstrom, David; and Rocker, Elmer, to Century Products, Inc. Security top or guard for infant's dressing table or the like. 3,777,673, Cl. 108-27.000.
Bleson, Eric John George; Furmidge, Kenneth Frederick; Stanyon, Horace Edward; and Speller, John Rueben Thomas, to Thorn Electrical Industries, Limited. Electric lamps and discharge devices. 3,778,663, Cl. 313-318.000.
Blitzer, Frank: *See*—
Pease, Richard R.; Blitzer, Frank; Giordano, Arthur A.; and Less, Frank L., 3,778,166.
Blochlinger, Ernst, to Schweizerische Industrie-Gesellschaft. Single-directional track-guided vehicle. 3,777,670, Cl. 104-246.000.
Blok, Petrus; and Viersma, Taco Jan. Double-acting servomotor. 3,777,621, Cl. 91-431.000.
Blonde, Pierre. Process for the production of lyophilized liver extract. 3,778,510, Cl. 424-106.000.
Bloom, William M., to Allegheny Ludlum Industries, Inc. Annealing furnace and method for its operation. 3,778,221, Cl. 432-11.000.
Boardman, Charles R.; and Knutson, Carroll F., to CER Geonuclear Corporation. Explosive fracturing method. 3,777,815, Cl. 166-247.000.
Bobeck, Andrew Henry; Copeland, John Alexander, III; and Wolfe, Raymond, to Bell Telephone Laboratories, Incorporated. Single wall domain propagation arrangement. 3,778,788, Cl. 340-174.0tf.
Bockly, Erich: *See*—
Gotze, Johannes; Bockly, Erich; and Riester, Oskar, 3,778,279.
Bockmann, August; Trenczek, Gerhard; Rudolph, Hans; Wiegreffe, Wolfgang; and Ritter, Wolfgang, to Bayer Aktiengesellschaft. Rendering inorganic pigments dispersible by incorporation of hydroxy-substituted 1,3-dioxa-2-sila-cyclohexanes. 3,778,289, Cl. 106-38.00q.
Bode, Charles H., Jr., to United States Steel Corporation. Quick release mechanism for continuous casting mold support frame. 3,777,436, Cl. 52-758.000.
Bodenseewerk Perkin-Elmer & Co., G.m.b.H.: *See*—
Schmedes, Helga; Hansen, Paul; and Welz, Bernhard, 3,778,156.
Bodway, George E., to Hewlett-Packard Company. Thin film capacitors and method for manufacture. 3,778,689, Cl. 317-258.000.
Boehringer Mannheim Gesellschaft mit beschrankter Haftung: *See*—
Bergmeyer, Hans Ulrich; Bernt, Erich; Gruber, Wolfgang; Schmidt, Felix Helmut; and Stork, Harald, 3,778,350.
Boeing Company, The: *See*—
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Stanislav, Kabele; Ctibor, Doudlebsky; Frantisek, Jaros; Zdenek, Svec; and Bohumir, Brozek, 3,777,466.
Boisserand, Monique. Fluid distributor. 3,777,776, Cl. 137-270.000.
Boisvert, Albert E. Apparatus for extracting crab meat. 3,777,332, Cl. 17-71.000.
Bolda Werka Photographische Gerate und Kunstsloff R. Gruter Kommanditgesellschaft: *See*—
Lange, Karl Heinz, 3,777,639.
Bolden, Thomas O.: *See*—
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Boles, Ralph C., Jr.: *See*—
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Bolton, Benjamin A.: *See*—
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Bomba, Joseph A.; and Bomba, Andrew J., 3,777,421.
Bomba, Joseph A.; and Bomba, Andrew J. Lawn border. 3,777,421, Cl. 47-33.000.
Bombardier Limited: *See*—
Talbot, Jean-Guy, 3,777,583.
Bond's Wear Pty. Limited: *See*—

Lee, Harold Barry, 3,777,683.

Booker, Philip P.; and Zeliznak, Richard, to Cominco Ltd. Coating process. 3,778,315, Cl. 148-6.300.

Boque, John C.: *See—*
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Borden Inc.: *See—*
Huelsman, Gregory J.; Bell, Robert E.; and Rohe, Gerald Edward, 3,778,395.

Borg-Warner Corporation: *See—*
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Borland, Walter G.: *See—*
Cromwell, Gordon W.; and Borland, Walter G., 3,778,730.

Bornfleth, Ulrich, to Hauni-Werke Korber Co. KG. Apparatus for manipulating containers for cigarettes or the like. 3,777,911, Cl. 214-16.40c.

Bosc, Henri J.; Colin, Jean-Marie H.; and Debuisser, Jean-Claude A., to International Standard Electric Corporation. Digital means for computing fourier transform of a series of samples. 3,778,604, Cl. 235-152.000.

Bosch, Paul: *See—*
Zellbeck, Gustav; Bosch, Paul; Veil, Karl; and Lutz, Gerhard, 3,777,888.

Bosch, Paul, to Bosch, Robert, G.m.b.H. Leakage reducing arrangement for an axial piston machine. 3,777,623, Cl. 91-487.000.

Bosch, Robert, G.m.b.H.: *See—*
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Duffner, Josef, 3,778,224.
Kinzel, Richard; and Mladek, Walter, 3,777,986.
Knapp, Heinrich; and Jaggle, Gunther, 3,777,726.
Liermann, Peter, 3,778,777.
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Reber, Harald; Jahnke, Horst; and Steiner, Walter, 3,778,313.
Stumpp, Gerhard; and Schuster, Gregor, 3,777,725.
Zellbeck, Gustav; Bosch, Paul; Veil, Karl; and Lutz, Gerhard, 3,777,888.

Boser, Ronald J., to B. & W. Manufacturing Co. Inc., mesne. Garment or like article having a slide fastener attached thereto. 3,777,314, Cl. 2-265.000.

Bosley, Denis V.: *See—*
Staats, William A.; Bosley, Denis V.; Cook, John S.; and Yamasaki, Toshio, 3,777,394.

Bosley, Denis V.; and Chang, Richard S., to Mattel, Inc. Detachable power module for flying toy aircraft. 3,777,420, Cl. 46-243.0av.

Bossers, Pieter A.: *See—*
Van Der Waaij, Dirk; Erkelens, Hendrik J.; Bossers, Pieter A.; and Kruiswijk, Franciscus J., 3,777,736.

Botnick, Irlin H.: *See—*
Botnick, Irlin H.; and Polster, Lewis H. (said Polster assor. to said), 3,777,840.

Botnick, Irlin H.; and Polster, Lewis H., said Polster assor. to said Botnick, Irlin H. Door mounted seat belt locking retractor. 3,777,840, Cl. 180-82.00c.

Boulton, William, Limited: *See—*
Cunningham-Smith, David, 3,777,770.

Bourne, Richard Curtis. One-wheel vehicle. 3,777,835, Cl. 180-10.000.

Bowerman, William R. Magnetic chip switch. 3,778,737, Cl. 335-205.000.

Bowker, John Kent, to Itek Corporation. System for analyzing multicolored scenes. 3,778,541, Cl. 178-5.20r.

Bowman, Theodore. Erectable and disassemblable partition and panel therefor. 3,777,431, Cl. 52-562.000.

Boyd, David C., to Corning Glass Works. Sodium aluminosilicate glass article strengthened by a surface compressive stress layer. 3,778,335, Cl. 161-164.000.

Boyles Industries Limited: *See—*
Wolda, Tiete Okke, 3,777,826.

Braden, Denver, to Illinois Tool Works Inc. Electrical circuit component having solder preform connection means. 3,778,532, Cl. 174-74.00r.

Brady, Lynn J.: *See—*
Holmes, Curtis L.; and Brady, Lynn J., 3,778,305.

Braid, Milton; and Quinty, David B., to Mobil Oil Corporation. Phosphorus- and nitrogen-containing lubricant additives. 3,778,375, Cl. 252-49.900.

Brandi, Henry W. Film resistors. 3,778,744, Cl. 338-260.000.

Brantman, Leon L.: *See—*
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Brath, Alfred: *See—*
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Braune, Gerhard: *See—*
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Braunstein, Simeon, to United States of America, Air Force. Photographic developer. 3,778,267, Cl. 96-66.0hd.

Braverman, Maynard, mesne: *See—*
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Breed, David S. Sharp edge orifice dashpot timer. 3,777,861, Cl. 188-317.000.

Brelot, Rene; and Tourret, Jean, to Compagnie des Compteurs. Optical distance converter. 3,778,157, Cl. 356-4.000.

Brems, John Henry. Motion and force transforming mechanism. 3,777,580, Cl. 74-110.000.

Breton, Ernest J.; and Worden, Dexter, to Composite Sciences, Inc. Process for coating metals using resistance heating of preformed layer. 3,778,586, Cl. 219-146.000.

Breuer, Hermann: *See—*
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Breuner, James H.; and Stumpf, Clarence E., Jr. Rotatable reel. 3,778,000, Cl. 242-77.200.

Brewer, Jack J., to Wallace, Sam P., Co., Inc. Building crane. 3,777,900, Cl. 212-58.00r.

Bridgestone Tire Company Limited: *See—*
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Briggs & Stratton Corporation: *See—*
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Tharman, Paul A., 3,778,650.

Briggs, Gifford G., to United States of America, Atomic Energy Commission. Method of producing NaF $2UF_4$. 3,778,500, Cl. 423-253.000.

Bright, William L. Shielding apparatus for electrical equipment. 3,778,682, Cl. 317-119.000.

Brill, Klaus: *See—*
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Brisk, Richard A.; Fougere, Guy L.; Lorah, Lawrence D.; and Pastan, Harvey L., to Little, Arthur D., Inc. Character detection system. 3,778,768, Cl. 340-146.3ag.

Bristol, William J. Water craft. 3,777,325, Cl. 9-310.00b.

British Insulated Callender's Cables Limited: *See—*
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British Leyland Truck and Bus Division Limited: *See—*
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Silverstone, Calvin Eric, 3,778,293.

British Railways Board: *See—*
Cribbens, Alan H., 3,778,761.

Britton, Anthony Sidney. Dispensing devices. 3,777,982, Cl. 239-315.000.

Brock, Larry D.; and Games, John E., to United Aircraft Corporation. Automatic track insertion and display. 3,778,601, Cl. 235-150.270.

Brockmann, Heinz, to Daimler-Benz Aktiengesellschaft. Blade mounting. 3,778,191, Cl. 416-215.000.

Brooks, Melvis. Fluid dispensing apparatus. 3,777,944, Cl. 222-394.000.

Brown & Sharpe Manufacturing Company: *See—*
Levesque, George N., 3,778,121.

Brown, Claude H., to Jet Research Center, Inc. Shaped charge enclosure apparatus. 3,777,663, Cl. 102-24.0hc.

Brown, Clayton R.; and Templer, Milton. Method and apparatus for recovery and refining of zinc. 3,778,044, Cl. 266-19.000.

Brown Company: *See—*
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Brown, D. S., Company, The: *See—*
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Brown, Daniel M.; and Isaacs, John D., to University of California, The Regents of the. Specific gravity sensor and a system employing the sensor. 3,777,574, Cl. 73-453.000.

Brown, Edward Douglas; and Leeney, Timothy John, to Imperial Chemical Industrial Limited. Bicycloheptene derivatives. 3,778,461, Cl. 260-464.000.

Brown, Graham Maurice, to Machine Tool Divisional Services Limited. Tool for gear finish forming. 3,777,345, Cl. 72-102.000.

Brown, Graydon L.: *See—*
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Brown, James D.; and Uraneck, Carl A., to Phillips Petroleum Company. Copolymers of cyclic monoolefins and cyclic polyolefin compounds. 3,778,420, Cl. 260-80.700.

Brown, Patrick M.; Duecker, Heyman C.; and Devore, Dorothy C., to Grace, W. R., & Co. Fusion bonded vermiculite molding material. 3,778,281, Cl. 106-67.000.

Brown, Richard E.: *See—*
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Brown, Russell L. Ornamental protective rail. 3,777,438, Cl. 52-173.000.

Bruce, Peter. Anchors. 3,777,695, Cl. 114-207.000.

Bruck Tool Company: *See—*
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Bruderhaus Maschinen G.m.b.H.: *See—*
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Brunelle, Lawrence J., to Olin Corporation. Caseless pellet igniting mechanism. 3,777,382, Cl. 42-1.00r.

Bucalo, Louis, to Investors In Venture, Inc. Method and device for reversibly interrupting fluid flow in a living being. 3,777,737, Cl. 128-1.00r.

Buchel, Karl Heinz: *See—*
Draber, Wilfried; Timmler, Helmut; Buchel, Karl Heinz; and Plempel, Manfred, 3,778,447.

Buck, James R., to Bruck Tool Company. Floating tool holder. 3,778,071, Cl. 279-16.000.

Buck, Richard S. Proportional beverage dispensing apparatus. 3,777,937, Cl. 222-70.000.

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Bull, Hans, to Hermann Hemscheidt Maschinenfabrik. Hydraulic pit prop. 3,777,619, Cl. 91-216.00r.

Bull, Ivor Henry, to Westinghouse Brake and Signal Company, Limited. Remote control arrangement. 3,778,813, Cl. 340-347.00dd.

Bulova Watch Company, Inc.: *See—*
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Stieler, Alfred Otto Hugo; and Billmann, Gerhard Leonhard Emil, 3,777,926.

Burch, Lyndon W., to B/K Electric Co., Inc. Circuit breaker. 3,778,739, Cl. 337-72.000.

Burckhardt, Urs; and Zimmermann, Markus, to Ciba-Geigy Corporation. Iodoethynyl pyridine compounds. 3,778,441, Cl. 260-290.000.

Burkhardt, Joseph A.; Childers, Thomas W.; Koerner, Roger J.; Mason, John P.; and Tidwell, Danny R., to Esso Production Research Company. Subsea production system. 3,777,812, Cl. 166-.600.

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Burn Treatment Skin Bank, Inc.: *See—*
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Burns, Joseph P.; Feltzin, Joseph; and Sanderson, Frank T., to ICI America Inc. Flame-retardant, polyurethan coating compositions. 3,778,408, Cl. 260-45.70p.

Burridge, Robert E.; and Everson, Peter O., to Craftings, Inc. Lampshade and method of assembly. 3,778,611, Cl. 240-108.00d.

Burroughs Corporation: *See—*
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Eisenberg, Mark F.; and Holz, George E., 3,778,673.
Harvey, Edgar Lloyd, 3,778,675.

Burrows, Charles B.; and Vajda, Edward A. Foundation strip for concrete molding. 3,778,020, Cl. 249-219.00r.

Burton, John S. Modular counter carry circuit. 3,778,600, Cl. 235-92.00c.

Burton, Thomas A.; and Moberg, Allen W., to Waters Instruments, Inc. Renal preservation system. 3,777,507, Cl. 62-306.000.

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Buryabash, Nelya Vasilievna: *See—*
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Busch, Theo; and Dienst, Rudolf, to Ludwig-Ofag-Indugas Industrieofenanlagen GmbH. Apparatus for the cooling of bodies under protective gas. 3,778,043, Cl. 266-2.00r.

Bussi, Ennio, to Fernando Fontana & C. S. a.s. Watchcase, in particular for a waterproof and subaqueous watch. 3,777,473, Cl. 58-90.00r.

Bustamante, Santiago J.; and Schell, Donald H., to United States of America, Atomic Energy Commission. Extrusion die. 3,778,217, Cl. 425-467.000.

Butler, Eugene B.; Fak, Ivan A.; and Line, Lawrence L., to General Tire and Rubber Company, The. Hydrophilic-poromeric foam. 3,778,332, Cl. 161-159.000.

Butler, Gene R.; and Butler, Lee D., to Sperry Rand Corporation. Dampening system for the transfer table of a bale wagon. 3,777,904, Cl. 214-6.00b.

Butler, Lee D.: *See—*
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Buttery, Kenneth T., to Brown Company. Dispensing carton. 3,777,957, Cl. 225-50.000.

Butts, Harlan: *See—*
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Buzano, Michel, to Societe Rhodiaceta. Process and apparatus for manufacture of a thermoplastic yarn with residual twist. 3,777,465, Cl. 57-34.0hs.

BWG Bergwerk- und Walzwerk-Maschinenbau G.m.b.H., Firma: *See—*
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Cables de Lyon-Alsacienne-Geoffroy: *See—*
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Cadiou, Jean G., to Societe Anonyme Automobiles Citroen. Devices for raising and lowering a car door window. 3,777,579, Cl. 74-99.000.

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Caffrey, Terrence, to Davey Compressor Company, The. Method and apparatus unloading a rotary compressor. 3,778,192, Cl. 417-286.000.

Calgon Corporation: *See—*
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California Car Wash Systems, Inc.: *See—*
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California Weavers, Inc.: *See—*
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Campman, James P.; and Linscott, Jack H., to Linscott, Jack H. and said Campman assor. of 1/2 to said Vidar Laboratories, Inc. Remotely controlled automatic utility meter reader. 3,778,795, Cl. 340-188.00r.

Canale, Raymond P.; and Brantman, Leon L., to Colt Industries Operating Corporation. Ambiently compensated turbine engine fuel control. 3,777,481, Cl. 60-39.280.

Canale, Raymond P.; and Ross, Wesley J., to Colt Industries Operating Corporation. Turbine engine control system. 3,777,482, Cl. 60-39.28r.

Cannon, Corbitt Thomas. Helicopter cargo pod. 3,778,011, Cl. 244-137.00r.

Cannon, Maxwell R., to International Business Machines Corporation. Readback systems for digital recorders. 3,778,787, Cl. 340-174.10h.

Canon Kabushiki Kaisha: *See—*
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Carlin, Bernard, 50% to Garrett, Billy J. Gate valve. 3,778,030, Cl. 251-327.000.

Carlyle, Bert Edward; Rawlings, Robert Louis; and Volk, Karl Erich, to Burroughs Corporation. Dynamic debug aid for computer data communication networks. 3,778,767, Cl. 340-146.10r.

Carnel, Alain, to Compteurs Schlumberger. Input connections for differential amplifiers. 3,778,619, Cl. 250-225.000.

Carney, John L., Jr.; and Duggi, Richard H., to ACF Industries, Incorporated. Hopper outlet structure for pneumatic unloading. 3,778,114, Cl. 302-52.000.

Carpenter, John M., to United States of America, Atomic Energy Commission. High intensity, pulsed thermal neutron source. 3,778,627, Cl. 250-499.000.

Carr, David William Bentley, to Spanset Inter AG. Slings. 3,778,095, Cl. 294-74.000.

Carrier Corporation: *See—*
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Carroll, Lee, to Smith, W. C., & Sons, Inc. Apparatus for tempering chocolate. 3,777,807, Cl. 165-26.000.

Carroll, Paul E., to Texas Instruments, Incorporated. Static filter for long line data systems. 3,778,759, Cl. 340-15.50f.

Carruth, Jack I. Cooking accessory. 3,777,653, Cl. 99-339.000.

Carruthers, Eben H. Position plotting apparatus. 3,778,832, Cl. 343-112.0pt.

Carson, David L., to United States of America, Navy. Transducer. 3,778,758, Cl. 340-10.000.

Carta, Guy R., to Research Corporation. Production of single cell protein material. 3,778,349, Cl. 195-33.000.

Castellano, Peter J.; and Galuten, Jerry H., to Audio-Optics Corporation, mesne. Cartridge-loaded sound motion picture projection. 3,778,137, Cl. 352-72.000.

Castrovillo, Salvatore J.; and Smollin, Henry A., to United States of America, Navy. Magnetic-electronic position encoder. 3,778,833, Cl. 343-118.000.

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Caveney, Jack Edward; Moody, Roy Alleyne; and Bulanda, John Jean, to Panduit Corporation. Wire termination and splicing system. 3,778,750, Cl. 339-97.00r.
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Chang, Richard S., to Mattel, Inc. Flyable toy aircraft with Jettisonable battery pack. 3,777,395, Cl. 46-243.0av.
Charbonneau, Fernand Armand, to JWI Ltd. Wear resistant outsert for a paper machine foil. 3,778,342, Cl. 162-352.000.
Charlesworth, Robert L., to Owens-Illinois, Inc. Photochromic material regeneration package. 3,777,390, Cl. 46-1.001.
Chase, Charles Elroy, Sr., to Tachisto Inc. Line-type generator having an active charging circuit. 3,778,636, Cl. 307-108.000.
Chase, Willis E.; and Plunkett, Bradley J., to Warwick Electronics, Inc. Electronicmusical instrument with phase shift tremulant system. 3,778,525, Cl. 84-1.250.
Cheek, Edward E.; and Sabin, Raymond H., to McDowell-Willman Engineering Company. Retractable railroad car clamp. 3,777,914, Cl. 214-55.000.
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Christen, Andreas, to Knoll International, Inc. Panel and post assembly. 3,777,437, Cl. 52-758.00d.
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Clark, Thomas F., to Allis-Chalmers Corporation. Ground-test switch. 3,778,574, Cl. 200-148.00b.
Clark, Willard; and Campbell, Charles, to Maul Bros., Inc. Method and apparatus for heat treating glassware. 3,778,245, Cl. 65-119.000.
Clavin, Alvin, to Hughes Aircraft Company. Circular symmetric beam forming apparatus. 3,778,838, Cl. 343-727.000.
Claxton, Gerald L., to Up-Right, Inc. Fruit-harvesting machine and conveyor therefor. 3,777,463, Cl. 56-330.000.
Clemence, Francois; and Le Martret, Odile, to Roussel-UCLAF. Certain benzimidazoles used as anti-inflammatory agents. 3,778,504, Cl. 424-263.000.
Clingman, William H., to Precision Machine Products, Inc. Methods of and means for determining the calorific value of combustible gases. 3,777,562, Cl. 73-190.00r.
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Cobb, Carolus. Process for growing crystals using an ozone enriched hydrogen-oxygen flame. 3,778,234, Cl. 252-301.40r.
Coetzee, Rudolf Gerhardus. Water cisterns. 3,777,316, Cl. 4-34.000.
Colardelle, Joel Serge; Lerouge, Claude Paul Henri; and Regbuer, Marc Andre, to International Standard Electric Corporation. Current-limited gyrator. 3,778,734, Cl. 333-80.00t.
Cole, Nancy C.; Gunkel, Ronald W.; and Houck, Clarence W., to United States of America, Atomic Energy Commission. Brazing filler metal for molybdenum. 3,778,254, Cl. 75-123.00r.
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Collins, Richard; and Denise, Donald, to Marotta Scientific Controls, Inc. Quick closing valve actuator. 3,778,027, Cl. 251-297.000.
Collins, Robert F., to Kendall Company, The. Folded surgical drape. 3,777,749, Cl. 128-132.00d.
Colman, William H., Jr., to Lenco, Inc. Sheet metal crimping attachment for impact gun. 3,777,687, Cl. 113-54.000.
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Control Data Corporation, mesne: *See—*
Milligan, Gene Emmett; Ho, Henry Minglo; and Kimura, Noboru, 3,778,792.
Cook, John S.: *See—*
Staats, William A.; Bosley, Denis V.; Cook, John S.; and Yamasaki, Toshio, 3,777,394.
Cooke, Anson R.: *See—*
Weston, Warren E.; and Cooke, Anson R., 3,778,248.
Cooke, John R. Surgical wound clip applier with disposable clip magazine. 3,777,355, Cl. 29-243.560.
Coombs, Robert V., to Sandoz-Wander, Inc. 9Alpha, 11-dimethyl-substituted steroids. 3,778,434, Cl. 260-239.55c.
Cooper, George P.; and Moore, Thomas H., to North American Rockwell Corporation. Magnetic deflection system for depressed-center sector scan display. 3,778,669, Cl. 315-23.000.
Cooper, Leah H. Lunch boxes and similar devices adapted to accommodate graphic data. 3,777,418, Cl. 35-62.000.
Cooper Range Company: *See—*
Finlay, Walter L.; Fisher, Henry J.; and Hay, Donald A., 3,778,318.
Copeland, John Alexander, III: *See—*
Bobeck, Andrew Henry; Copeland, John Alexander, III; and Wolfe, Raymond, 3,778,788.
Copier, Harald; and Tonsbeek, Christiaan Herman Theodoor, to Lever Brothers Company. Flavoring with certain 2-acyl-2-thiazolines. 3,778,518, Cl. 426-175.000.
Coppi, Bruno; and Montgomery, Donald B., to United States of America, Atomic Energy Commission. Device for plasma confinement and heating by high currents and non-classical plasma transport properties. 3,778,343, Cl. 176-3.000.
Copy Research Corporation: *See—*
Rothacker, Francis N.; and Bujese, David P., 3,778,690.
Corco, Inc.: *See—*
Schieser, Warren J.; and Vickers, Stanley E., 3,777,913.
Corey, Robert W. Monorail switching device. 3,777,668, Cl. 104-105.000.
Corlet, Gabriel, to Application des Gag. Device for connecting a dispensing coupler to a container for fluid under pressure. 3,777,789, Cl. 141-329.000.
Cornelius, Edward B.; and Koester, David W., to Air Products and Chemicals, Inc. Chromia-alumina catalyst. 3,778,388, Cl. 252-465.000.
Cornelius, William J., to Keyes Fibre Company. Fruit container. 3,778,516, Cl. 426-119.000.
Corning Glass Works: *See—*
Boyd, David C., 3,778,335.
Cortner, William C., Jr., to Alley-Johnson Company. Livestock dusting bag. 3,777,716, Cl. 119-159.000.
Coscia, Anthony Thomas: *See—*
Williams, Laurence Lyman; and Coscia, Anthony Thomas, 3,778,339.
Cote, James D., to General Motors Corporation. Hydraulic engine governor. 3,777,729, Cl. 123-140.0fg.
Cotton, Incorporated: *See—*
Lewis, Harold Loyd, 3,778,509.
Coulter Chemistry, Inc., mesne: *See—*
Jones, Alan Richardson, 3,777,785.
Coulter, Gordon L.; and Pearsall, Duane D., to Rixson Inc. Condition responsive door holder-closer. 3,777,423, Cl. 49-31.000.
Countryman, Albert J., to Ty-Lok Assembly Systems, Inc. Ribbed strapping. 3,777,334, Cl. 24-169.00b.
Courtaulds Limited: *See—*
Betts, Max William; and Robinson, Frank, 3,777,511.
Courtney-Pratt, Jeofry Stuart, to Bell Telephone Laboratories, Incorporated. Process for rendering transparent media artificially opalescent and resulting product. 3,778,361, Cl. 204-157.0lr.
Craftings, Inc.: *See—*
Burridge, Robert E.; and Everson, Peter O., 3,778,611.
Crandall, Richard N. Method and apparatus for comminuting. 3,777,993, Cl. 241-15.000.
Crandlemire, Roger C. Stack packer. 3,777,657, Cl. 100-49.000.
Crawford Fitting Company: *See—*
Shendure, Ashok S., 3,777,782.
Crawford, Robert Hudson, to Texas Instruments, Incorporated. MOS-bipolar high voltage driver circuit. 3,778,688, Cl. 317-235.00g.
Crawford, Thomas B. Drilling mud reclaiming apparatus. 3,777,405, Cl. 34-57.00r.
Creative Polymer Products Corporation: *See—*
Posner, Richard, 3,778,323.
Crepinsek, Alois, to Security Technology Corporation. Lock assembly of the rotory cylinder type. 3,777,520, Cl. 70-358.000.
Crescent Toy Company Limited, The: *See—*
Eagles, Harry John William, 3,777,386.
Cribbens, Alan H., to British Railways Board. Vehicle orientation determination. 3,778,761, Cl. 340-39.000.
Croce, Louis J.; and Bajars, Laimonis, to Petro-Tex Chemical Corporation. Iron alloy catalyzed oxidative dehydrogenation. 3,778,488, Cl. 260-680.00e.
Cromwell, Gordon W.; and Borland, Walter G., to Elgin Electronics, Inc. Low harmonic telephone ringing generator. 3,778,730, Cl. 331-109.000.
Crosby, Edward K.: *See—*
Kightlinger, Adrian P.; Crosby, Edward K.; and Speakman, Edwin L., 3,778,431.
Crucible Steel Company of America: *See—*
Lyne, Cornelius M.; Kasak, August; and Stasko, William, 3,778,253.
Crucible Steel Corporation: *See—*
Pinnow, Kenneth E.; Mehta, Jayendra M.; and Moskowitz, Arthur, 3,778,316.
Cryer, Edward, to Lucas, Joseph, (Industries) Limited. Direction indicator switches for road vehicles. 3,778,571, Cl. 200-61.350.
Csaky, Thaddeus G.; and Lenger, Karl Werner. Free piston engine. 3,777,722, Cl. 123-46.00r.
Ctibor, Doudlebsky: *See—*
Stanislav, Kabele; Ctibor, Doudlebsky; Frantisek, Jaros; Zdenek, Svec; and Bohumir, Brozek, 3,777,466.
CTS Corporation: *See—*
Holmes, Curtis L.; and Brady, Lynn J., 3,778,305.
Cuccio, Allen B. J., to General Electric Company. Keyboard data entry device employing reactive coupling circuits. 3,778,816, Cl. 340-365.00s.
Cude, Arthur Leslie; and Simpson, Henry George, to Imperial Chemical Industries Limited. Dispersal of flammable materials. 3,777,821, Cl. 169-2.00r.
Cumberland Corporation: *See—*
Rhinehart, Vance, 3,777,710.
Cummingham, Herbert R.: *See—*
United States of America, National Aeronautics and Space Administration, 3,777,942.
Cunningham-Smith, David, to Boulton, William, Limited. Apparatus for the treatment of paris. 3,777,770, Cl. 134-118.000.
Curcic, Simo, to Coal Industry (Patents) Limited. Electrical connector. 3,778,747, Cl. 339-45.00m.
Curtis Instruments, Inc.: *See—*
Finger, Eugene P., 3,778,702.
Custom Machine, Inc.: *See—*
Wloszek, Joseph T., 3,777,553.
Cutler, Norman W.; Pasieka, John F.; and Seider, Myron A., to Polaroid Corporation. Photographic apparatus. 3,777,645, Cl. 95-49.000.
Cutler-Hammer, Inc.: *See—*
Baker, Dale A.; and McCarthy, John M., 3,777,910.
Leavitt, Minard A., 3,778,155.
Lindemann, Robert W.; and Parmley, John W., 3,778,620.
Cuvelier, Georges; and Wattiez, Daniel, to Institut Textile de France. Reactive dyeing of epoxy alkyl quaternary ammonium cellulose or polyvinyl alcohol textiles. 3,778,225, Cl. 8-31.000.
Cuvelier, Georges; and Wattiez, Daniel, to Institut Textile de France. Reactive dyeing of epoxy alkyl quaternary ammonium cellulose or polyvinyl alcohol textiles. 13,778,225, Cl. 8-31.000.
Czaplinski, Thomas V., to Squibb, E. R., & Sons, Inc. Apparatus for evacuating liquid from a chamber. 3,777,780, Cl. 137-576.000.
Dahl, Rolf, to Continental Tapes, Incorporated. Certain permeable materials impregnated with a polyurethane polymer. 3,778,302, Cl. 117-122.0pb.
Dahl, William R., to Honeywell Inc. Disposable fiber tip marker. 3,778,840, Cl. 346-30.000.
Dahmen, Alexander: *See—*
Zoller, Robert; Fester, Walter; Jakob, Franz; and Dahmen, Alexander, 3,778,416.
Dahms, Wolfgang; and Todt, Hans-Gunther, to Schering AG. Electrolyte and method for electrodepositing copper. 3,778,357, Cl. 204-52.00r.
Daimler Benz Aktiengesellschaft: *See—*
Andres, Rudolf, 3,777,625.
Daimler-Benz Aktiengesellschaft: *See—*
Brockmann, Heinz, 3,778,191.
Forster, Hans-Joachim M.; and Hensel, Werner, 3,777,860.
Fricker, Ludwig, 3,777,927.
Pattas, Konstantin, 3,777,718.
Renner, Hermann, 3,778,093.
Dally, James W.: *See—*
Anderson, Philip J.; and Dally, James W., 3,778,109.

Damratowski, Leonard P., to Carrier Corporation. Apparatus for and a method of operating power recovery equipment. 3,777,486, Cl. 60-105.000.

Danehy, Robert P.; Kitchell, Bruce N.; and Silva, Antonio V., to Westinghouse Electric Corporation. Method and apparatus for cold rolling mill gauge deviation correction. 3,777,524, Cl. 72-8.000.

Danfoss A/S: *See—*
Giversen, Svend, 3,778,198.

Danielsson, Nils Harry, to Alfa-Laval AB. Animal watering device. 3,777,714, Cl. 119-75.000.

Davey Compressor Company, The: *See—*
Caffrey, Terence, 3,778,201.
Caffrey, Terrence, 3,778,192.

David, Guy Albert Jules; and Duquenne, Michel Guy Amedee, to U.S. Philips Corporation. System for synchronizing clock signals to incoming data. 3,778,550, Cl. 178-69.50r.

Davidson, Gene E.: *See—*
Fisher, Glen W.; Robbins, Dewey H.; Evans, Victor J.; and Davidson, Gene E., 3,778,521.

Davies, Brian W. Liquid container-tool or accessory box for bicycles. 3,777,955, Cl. 224-35.000.

Davies, Norman, to Westinghouse Electric Corporation. Circuit interrupter with interlocking mechanism. 3,778,567, Cl. 200-50.00a.

Davies, Terrence Ardern, to Square D Company. Light-duty electrical contacts of silver and ruthenium oxide. 3,778,257, Cl. 75-173.00a.

Davis, Dan Bryan: *See—*
Iyengar, Rama; and Davis, Dan Bryan, 3,777,371.

Davis, John C.: *See—*
Fromknecht, Charles Thomas; and Davis, John C., 3,778,577.

Davis, Richard A.: *See—*
Ruiten, Donald E.; and Davis, Richard A., 3,777,790.

Dayton Wright Associates Limited: *See—*
Wright, William Michael D., 3,778,562.

De Carlo, Joseph P. Window cleaning apparatus. 3,778,173, Cl. 401-10.000.

De Koning, Cornelis J., to Vissers, H., N.V. Spreader. 3,777,992, Cl. 239-689.000.

De Mino, Angelo. Fishing rod holder. 3,777,389, Cl. 43-15.000.

De Shazor, James C. Article handling and packaging machine. 3,777,450, Cl. 53-138.00r.

De Visscher, Patrick M. Joining of containers. 3,777,771, Cl. 137-1.000.

De Vries, Louis: *See—*
Kennedy, Brian R.; and De Vries, Louis, 3,778,370.

Deaton, Ronald L.; and Silver, Gary L., to United States of America, Atomic Energy Commission. Plutonium recovery from organic materials. 3,778,497, Cl. 423-2.000.

Deats, Richard A. Mobile hay feeder. 3,777,713, Cl. 119-60.000.

Debuisser, Jean-Claude A.: *See—*
Bosc, Henri J.; Colin, Jean-Marie H.; and Debuisser, Jean-Claude A., 3,778,604.

Deeks, Ronald G. Pressure flow discharge mechanism. 3,777,912, Cl. 214-152.000.

Degerman, Karl Johan Olov: *See—*
Samuelsson, Mokjas Erik Samuel; Samuelsson, Mokjas Jonas; and Degerman, Karl Johan Olov, 3,777,537.

Deguchi, Takashi: *See—*
Yamahara, Takeshi; and Deguchi, Takashi, 3,778,471.

Dehne, Clarence A., to Webb, Jervis B., Company. Control for a conveyor take-up. 3,777,879, Cl. 198-208.000.

Delano, Charles G., to Mustang Oil Tools, Inc. Cementing well bore casing. 3,777,819, Cl. 166-285.000.

Delbar Products, Inc.: *See—*
Holzman, James W., 3,778,015.

Delmoran AG: *See—*
Marti, Willi Hermann, 3,777,864.

Demerson, Christopher A.: *See—*
Jirkovsky, Ivo; Humber, Leslie G.; Demerson, Christopher A.; and Dobson, Thomas A., 3,778,449.

Dence, Geoffrey Roy. Air filters. 3,777,458, Cl. 55-287.000.

Dendy, Jackie D.; Johnson, Robert D.; and Peevey, Robert M., to Amoco Production Company. Check valve for hydraulic control system. 3,777,813, Cl. 166-72.000.

Denise, Donald: *See—*
Collins, Richard; and Denise, Donald, 3,778,027.

Denk, Edward G., to Polaroid Corporation. Sedimentation process for flocculated dispersions. 3,778,275, Cl. 96-94.000.

Denki Onkyo Company, Ltd.: *See—*
Kawada, Takehiko, 3,778,648.

Dennhardt, Werner; and Schroter, Herbert, to Kalle Aktiengesellschaft. Method of and apparatus for automatically controlling the speed at which an original and copying material pass through a copying machine. 3,778,154, Cl. 355-68.000.

Denny, Bradley J., to Hughes Aircraft Company. Time-at-temperature AC reflow soldering power supply. 3,778,581, Cl. 219-85.000.

Deskin Corporation, The: *See—*
Emerson, Christopher Plummer, 3,777,485.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Klotzer, Erhard; and Pochert, Johannes, 3,778,406.

Deutsche Texaco Aktiengesellschaft: *See—*
Meier, Albert, 3,777,816.

Devine, Howard E., to American Thread Company, The, mesne. Disposable sewing machine bobbin. 3,778,004, Cl. 242-169.000.

DeVisser, Christian; and Myers, Donald Orville, to General Electric Company. Automatic electric power source transfer apparatus. 3,778,633, Cl. 307-64.000.

Devore, Dorothy C.: *See—*
Brown, Patrick M.; Duecker, Heyman C.; and Devore, Dorothy C., 3,778,281.

Di Settembrini, Antoine. Apparatus for mass producing hollow objects. 3,778,213, Cl. 425-326.00b.

Diamond Shamrock Corporation: *See—*
Pyne, William J.; Gullo, James M.; and Adams, Bobby F., 3,778,247.

Dianetti, Joseph C., to American Optical Corporation. Ophthalmometer having alternative viewing and measuring systems and including an improved illumination system. 3,778,135, Cl. 351-13.000.

Diaz, Raul G.: *See—*
Andow, Paul; Guillen, David; and Diaz, Raul G., 3,778,052.

Dibelius, Norman R.; and Schiefer, Richard B., to General Electric Company. Shrouded combustion liner. 3,777,484, Cl. 60-39.650.

Diemakers, Inc.: *See—*
Spalding, Robert H.; and Spalding, James A., 3,777,943.

Dienst, Rudolf: *See—*
Busch, Theo; and Dienst, Rudolf, 3,778,043.

Diepers, Heinrich: *See—*
Pfister, Hans; and Diepers, Heinrich, 3,777,368.

Dierbeck, Robert F. Aerator with improved impeller action. 3,778,037, Cl. 261-28.000.

Diesel Kiki Kabushiki Kaisha: *See—*
Kobayashi, Masayoshi; and Uchino, Mitsuo, 3,777,731.

Dietemeyer, Stanley A., to Reliance Electric Company. Electronic weighing system with digital readout. 3,777,828, Cl. 177-165.000.

Diginetics Incorporated: *See—*
Snook, Richard K., 3,778,710.

Digital Telephone Systems, Inc.: *See—*
Nordling, K. Fredrik; and Huey, Samuel T., 3,778,555.

Dildy, Clell A., Jr., to United States of America, Navy. Waveform synthesizer. 3,778,814, Cl. 340-347.0da.

Dillard, Paul A. Expandable room for portable living quarters. 3,778,100, Cl. 296-23.00g.

Dimitriou, Christos: *See—*
Taylor, Richard F.; and Dimitriou, Christos, 3,778,106.

Dittrich, Werner, to Dynamit Nobel Aktiengesellschaft. Paints and coatings. 3,778,280, Cl. 106-1.000.

Dixon, Kenneth Raymond. Radial hydraulic motors and pumps. 3,777,624, Cl. 91-488.000.

Dmitriev, Efim Fedorovich: *See—*
Sherman, Vladimir Efimovich; Dubonosov, Georgy Viktorovich; Portnov, Sergei Fedorovich; Fedotov, Jury Alexeevich; Grinberg, Yakov Zeemanovich; Soloviev, Nikodim Nikiforovich; Pavlov, Viktor Grigorievich; and Dmitriev, Efim Fedorovich, 3,777,534.

Dobras, Bruce W.: *See—*
Vanderpool, James L.; and Dobras, Bruce W., 3,778,597.

Dobson, Thomas A.: *See—*
Jirkovsky, Ivo; Humber, Leslie G.; Demerson, Christopher A.; and Dobson, Thomas A., 3,778,449.

Doherty, Orval Austin: *See—*
Ali, Syed Aejaz; and Doherty, Orval Austin, 3,777,677.

Doll, Robert; and Berndt, Hartmut. System for contact-free, axially stabilized and radially centered positioning of a rotating shaft, particularly of an operating machine for low temperatures. 3,778,122, Cl. 308-10.000.

Domaas, Perry M., to Textron, Inc. Centrifugal clutch. 3,777,584, Cl. 74-230.17e.

Domestic Fabrics Corporation: *See—*
Traumuller, Martin; and Hunneke, Fred, 3,777,514.

Doner, Harvey E.: *See—*
Mortland, Max M.; and Doner, Harvey E., 3,778,457.

D'Onofrio, Mario L., to Spiral Tubing Corporation. Method for forming a helically corrugated concentric tubing unit. 3,777,343, Cl. 29-157.30r.

Dooley, Joseph Francis, to Pfizer Inc. Diagnostic composition for the quantitative determination of glucose. 3,778,384, Cl. 252-408.000.

Dore, Allen J. Water injection system. 3,778,039, Cl. 261-18.00a.

Dore, John L., Co.: *See—*
Graves, Gail W.; Pope, Gerald R.; Stewart, Joseph T., Jr.; and Petrosky, Willard L., 3,778,028.

Dorgebray, Gerard, to Elf Union. Pipe-leak detection method and device. 3,778,613, Cl. 250-303.000.

Doric Corporation: *See—*
Youra, Charles J., 3,777,602.

Dormanns, Stefanie, nee Furst: *See—*
Furst, Stefan, 3,777,468.

Dorzan, Peter A. Method and device for retrieving litter. 3,778,097, Cl. 294-118.000.

Doucerain, Jacques; and Baumann, Bernard, 50% to Cabel and 50% to Societe de Traitements Electrolytiques et Electrothermiques. Apparatus for joint manufacture. 3,778,017, Cl. 249-78.000.

Dove, Norman F. Steam supply apparatus. 3,777,781, Cl. 137-608.000.

Dow any, The: *See—*
Meeks, Merrtt R.; Monroe, Roger F.; and Weber, Richard M., 37,779,341.

Dow Chemical Company, The: *See—*

Meeks, Merritt R.; Monroe, Roger F.; and Weber, Richard M., 3,777,934.
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Dow Chemical Corporation, The: *See—*
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Dowty Technical Developments Limited: *See—*
Doydell, Kenneth Haymond; and Flint, John Christopher Eglington, 3,777,492.

Doydell, Kenneth Haymond; and Flint, John Christopher Eglington, to Dowty Technical Developments Limited. Hydraulic apparatus including variable delivery pumps. 3,777,492, Cl. 60-462.000.

Draber, Wilfried; Timmler, Helmut; Buchel, Karl Heinz; and Plempel, Manfred, to Bayer Aktiengesellschaft. N-[substituted] fluorene-,dibenzocycloheptane- and dibenzocycloheptene-imidazoles. 3,778,447, Cl. 260-309.000.

Dresser Industries, Inc.: *See—*
Eversole, James F.; and Berriman, Lester P., 3,778,038.

Drew, Richard E.: *See—*
Howell, Charles B.; and Drew, Richard E., 3,778,170.

Drexelbrook Controls Inc.: *See—*
Maiby, Frederick L., 3,778,705.

Driscoll, Gary L.; Duling, Irl N.; and Gates, David S., to Sun Research and Development Co., mesne. Polyisobutylene oil having a high viscosity index. 3,778,487, Cl. 260-676.00r.

Driscoll, Richard P.; Lannert, James W.; and Beaver, Donald V., to All-Steel Equipment, Inc. Chair base swivel arrangement. 3,778,014, Cl. 248-406.000.

Drogi, Dieter, to Olympia Werke AG. Escapement controlling tabulating apparatus. 3,777,870, Cl. 197-94.000.

Droz, Francois; Petitpierre, Jean-Paul; and Tosalli, Joseph, to Reuge S.A. Ski binding. 3,778,075, Cl. 180-11.35t.

Du Pont de Nemours, E. I., and Company: *See—*
Citron, Joel D., 3,778,430.
Fuchs, Julius Jakob, 3,778,475.
Garth, Bruce Hollis, 3,778,310.
Josey, Alden D.; and Kirchner, Jack R., 3,778,452.
Kissa, Erik, 3,778,226.
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Seney, John Seymour, 3,777,959.
Sturgeon, Donald L. G., 3,778,334.
Walus, Aloysius N., 3,778,403.
Weigert, Frank J., 3,778,446.
Wyeth, Nathaniel Convers; and Roseveare, Ronald Newman, 3,778,214.

Du Pont de Nemours, E. I., and Company, mesne: *See—*
Barnes, Ronald B., 3,777,349.

Dubonosov, Georgy Viktorovich: *See—*
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Duchenoy, Jacques: *See—*
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Duecker, Heyman C.: *See—*
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Duffner, Josef, to Bosch, Robert, G.m.b.H. Jig for firing of ceramic spark plug insulation. 3,778,224, Cl. 432-258.000.

Duggi, Richard H.: *See—*
Carney, John L., Jr.; and Duggi, Richard H., 3,778,114.

Duling, Irl N.: *See—*
Driscoll, Gary L.; Duling, Irl N.; and Gates, David S., 3,778,487.

Dunlap, Frederick A.; and Wilcox, Lyle C., to Greenwood Mills Corporation. Strand tester. 3,777,557, Cl. 73-95.000.

Dunn, Kirkley J. Sanding block and abrasive envelope therefor. 3,777,444, Cl. 51-391.000.

Duquenne, Michel Guy Amedee: *See—*
David, Guy Albert Jules; and Duquenne, Michel Guy Amedee, 3,778,550.

Durdin, Peter Robert, to AMF Incorporated. Time switches. 3,777,582, Cl. 74-112.000.

Durwald, Dierk. Roller trackway construction. 3,777,867, Cl. 193-35.00a.

Dusenberg, John, Company, Inc.: *See—*
Schofield, Edward F., 3,777,607.

Dyanmit Nobel Aktiengesellschaft: *See—*
Gawlick, Heinz; Bendler, Hellmut; and Jensen, Ernst, 3,777,664.

Dye, John F.: *See—*
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Dynair Limited: *See—*
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Dynamit Nobel Aktiengesellschaft: *See—*
Dittrich, Werner, 3,778,280.
Junger, Hans; and Weissenfels, Franz, 3,778,413.
Lingens, Paul; and Martin, Gerhard, 3,777,662.

E. F. Industries, Inc.: *See—*
Hunter, Bryan J., 3,777,698.

Eagles, Harry John William, to Crescent Toy Company Limited, The. Toy pistols. 3,777,386, Cl. 42-58.000.

Eastman Kodak Company: *See—*
Allinger, Hubert B.; and Edwards, Harry L., 3,778,631.
Fields, Gary D., 3,778,149.
Kuhfuss, Herbert F.; and Jackson, Winston J., Jr., 3,778,410.
Larson, Lars M.; Feasey, Raymond J.; and Wheeler, Robert S., 3,777,451.
Luckey, George W., 3,778,615.
Metzger, Lenard M.; and Babcock, David L., 3,778,545.
Millet, Marcus J., 3,777,644.
Rosenburgh, Norman J., 3,778,599.
Spaller, Albert E., Jr., 3,777,610.

Eberly, David H., Jr.; and Hanke, Peter E., to United States Banknote Corporation. Document authentication method and apparatus. 3,778,598, Cl. 235-61.11d.

Eberspacher, J.: *See—*
Kofink, Siegfried, 3,777,975.

Echlin Manufacturing Corporation, The: *See—*
Anderson, Harold Francis; Shove, Gordon William; Morin, Louis George; and Gackstetter, Henry Clinton, 3,778,576.

Eckholm, Robert J. Disposable nursing device. 3,777,925, Cl. 215-11.00e.

Eckman, Richard S.: *See—*
Pacella, Gerald M.; and Eckman, Richard S., 3,777,989.

Ecodyne Corporation: *See—*
Henderson, Robert A., 3,777,889.

Edinborgh, Julius A., to Shell Oil Company. Personal sound monitor. 3,778,552, Cl. 179-1.00n.

EDMAC Associates, Inc.: *See—*
Nupp, Raymond W., 3,778,728.

Educational Sound Systems, Inc.: *See—*
MacNeill, John H.; Bellinger, James E.; Lidkea, Harrison B.; and Seib, Kenneth L., 3,777,417.

Edwards, Gordon J.: *See—*
Arff, Uwe F.; and Edwards, Gordon J., 3,777,401.

Edwards, Harry L.: *See—*
Allinger, Hubert B.; and Edwards, Harry L., 3,778,631.

Edwards, Norman W., to Pittsburgh-des Moines Steel Company. Storage tank for offshore storage of liquid and method of constructing and installing same. 3,777,497, Cl. 61-46.500.

Edwards, Robert L., to National Seating Company. Vehicle seat. 3,778,103, Cl. 297-331.000.

EG&G, Inc.: *See—*
Balston, William J., 3,778,807.

Ehemann, Walter: *See—*
Grebner, Fritz; Kolsch, Wilhelm; Spindler, Gerhard; and Ehemann, Walter, 3,777,433.

Eholzer, Ulrich: *See—*
Schubart, Rudiger; Eholzer, Ulrich; Kempermann, Theo; and Roos, Ernst, 3,778,419.

Ehrlich, Mary Roberta. Combined display and storage rack. 3,777,896, Cl. 211-49.000.

Eichner Organisation KG: *See—*
Spiroch, Franz; and Ostwald, Heinz G., 3,777,997.

Eisenberg, Mark F.; and Holz, George E., to Burroughs Corporation. Low power display driver having brightness control. 3,778,673, Cl. 315-169.000.

Eisenwerke Kaiserslautern GmbH: *See—*
Gehlen, Herman Walter; Hartmann, Karl; and Thieme, Gerhard, 3,777,503.

El-Tronics, Inc.: *See—*
Fajt, John; and Neal, James V., Jr., 3,778,584.

Electronor Corporation, mesne: *See—*
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Elevators Pty. Limited: *See—*
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Elf Union: *See—*
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Elgin Electronics, Inc.: *See—*
Cromwell, Gordon W.; and Borland, Walter G., 3,778,730.

Ellanin Investment, Ltd.: *See—*
Lowry, John D., 3,778,543.

Ellicott Machine Corporation: *See—*
Turner, Thomas M.; Keefe, Francis J.; and Little, Charles D., 3,777,376.

Elliott, Brantford G., to Harrington Manufacturing Co., Inc. Mowing device. 3,777,459, Cl. 56-15.300.

Elliott, Charles G.; and Mazzur, Richard P., to Armstrong Cork Company. Process for producing a decorative surface covering. 3,778,291, Cl. 117-21.000.

Ellis, Sloan E., 50% to San Saba Development Association. Litter pick-up machine. 3,777,327, Cl. 15-84.000.

Ellstrom, Johas Ragnar, to Junkers & Co., G.m.b.H. Control apparatus for a cooling device. 3,778,591, Cl. 219-279.000.

Elmer, Arthur Ernest Henry, to Dynair Limited. Fluid pressure released clutch for fans. 3,777,866, Cl. 192-91.00a.

Elmo Company, Limited: *See—*
Takahashi, Torataro, 3,778,136.

Emerick, Carl M.; and Pauze, Denis R., to General Electric Company. Polyamide acids and polyamideimides. 3,778,411, Cl. 260-65.000.

Emerson, Christopher Plummer, to Deskin Corporation, The. Vaporized fluid powered engine. 3,777,485, Cl. 60-95.000.

Emerson Electric Co.: *See—*
Williams, Michael, 3,778,592.
Wright, James A.; and Forrest, Robert L., 3,778,218.

Emerson Electric Company: *See—*

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EMI Limited: *See—*
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Empire Products, Inc.: *See—*
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Enander, Per Henry, to Skogsdon Aktiebolag. Tree felling guider. 3,778,031, Cl. 254-1.000.

Endo, Takaya: *See—*
Fujiwhara, Mitsuto; Kozima, Tamotsu; Imamura, Hiroyuki; and Endo, Takaya, 3,778,277.

Endress, James W., to Carrier Corporation. Rotor structure with squirrel cage winding. 3,778,652, Cl. 310-211.000.

Endsley, Richard A., to Alloy Metals, Inc. Titanium brazing alloy. 3,778,258, Cl. 75-173.00r.

Engel, Emil. Device for providing irish coffee. 3,777,652, Cl. 99-175.000.

Engel Industries, Inc.: *See—*
McClain, Lamont R., 3,777,531.

Engelae, Gunter: *See—*
Weinert, Volker; Frankiewicz, Gerhard; and Engelae, Gunter, 3,777,960.

Engelhardt, Helmut, to Krohne, Ludwig. Flow meter housing construction. 3,778,091, Cl. 285-238.000.

Enneking, Heinrich, to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft. Apparatus for false-twisting multifilament threads and the like. 3,777,467, Cl. 57-77.400.

Entryown Patents Ltd.: *See—*
Parsons, Rodney, 3,777,674.

Epoch Company Ltd.: *See—*
Matsumoto, Teruo, 3,777,411.

Epstein, Harold M.: *See—*
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E.R.E. Laboratory, Inc.: *See—*
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Erickson, Fred William, to Litton Systems, Inc. Differential magnetic deflection amplifier. 3,778,671, Cl. 315-27.0td.

Erickson, Kent E., to Keuffel & Esser Company. Electro-optic displacement device. 3,778,158, Cl. 356-28.000.

Ericson, Alvin L.; Haettinger, George C.; and Pedersen, Ernest T., to Union Carbide Corporation. Shouldered wickets. 3,777,930, Cl. 221-26.000.

Erkelens, Hendrik J.: *See—*
Van Der Waaij, Dirk; Erkelens, Hendrik J.; Bossers, Pieter A.; and Kruiswijk, Franciscus J., 3,777,736.

Esposito, Vincent J., Jr., 50% to Barnett, Erwin M. Poolside swing having a seat with an ejection slide mechanism. 3,778,054, Cl. 272-85.000.

Essner, Howard. Surgical stick. 3,777,760, Cl. 128-269.000.

Esso Production Research Company: *See—*
Burkhardt, Joseph A.; Childers, Thomas W.; Koerner, Roger J.; Mason, John P.; and Tidwell, Danny R., 3,777,812.
Matthews, Jamie F., Jr., 3,777,499.

Esso Research and Engineering Company: *See—*
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Hamner, Glen P.; and Mason, Ralph B., 3,778,365.
Lang, Robert J.; Holt, Eugene L.; and Stoneback, David N., 3,778,501.
Parker, Paul T.; and Mayer, Ivan, 3,778,489.

Estabrook, Mark R., to Barnes Drill Co. Cyclone separator. 3,777,788, Cl. 141-279.000.

Ethyl Corporation: *See—*
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Malec, Robert E., 3,778,371.
Wollensak, John C.; and Zaweski, Edward F., 3,778,460.

Ethyl Development Corporation: *See—*
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Evans, Victor J.: *See—*
Fisher, Glen W.; Robbins, Dewey H.; Evans, Victor J.; and Davidson, Gene E., 3,778,521.

Eversole, James F.; and Berriman, Lester P., to Dresser Industries, Inc. Method and apparatus for mixing and modulating liquid fuel and intake air for an internal combustion engine. 3,778,038, Cl. 261-50.00r.

Everson, Peter O.: *See—*
Burridge, Robert E.; and Everson, Peter O., 3,778,611.

Faber, Kurt Heinrich Albert Erich, to Sandvik Aktiebolag. Cutting insert and cutting tool assembly. 3,777,341, Cl. 29-95.00r.

Fair, Delbert W.; Brown, Graydon L.; and Miller, J. H., Jr., to Continental Oil Company. Seismic vibratory system. 3,777,843, Cl. 181-5.0vm.

Fairchild Camera and Instrument Corporation: *See—*
Schinella, Richard D.; and Herndon, William H., 3,777,364.

Fairchild, Wayne K., to Automation Industries, Inc. Flexible tubing manufacturing machine. 3,778,327, Cl. 156-425.000.

Fairfield Engineering and Manufacruting Co.: *See—*
Slough, Ronald S.; and Jones, Robert D., 3,778,233.

Fajt, John; and Neal, James V., Jr., to El-Tronics, Inc. Apparatus for clamping and aligning parts for welding. 3,778,584, Cl. 219-101.000.

Fak, Ivan A.: *See—*
Butler, Eugene B.; Fak, Ivan A.; and Line, Lawrence L., 3,778,332.

Falborg, Helge Jorgen, to Maskinfabriken Hefa, Aabybro A/S. Apparatus to be used in connection with the filling of tubular films, so called synthetic casings. 3,777,331, Cl. 17-32.000.

Farber, Elliott; Rosen, Milton K.; and Shah, Ashok C., to Tenneco Chemicals, Inc. Process for the production of vinyl halide polymers. 3,778,422, Cl. 260-92.80w.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
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Faroudja, Yves C.: *See—*
Bass, Harland A.; and Faroudja, Yves C., 3,778,718.

Faulkner, Douglas W.: *See—*
Jones, Neal K.; Faulkner, Douglas W.; Johnston, Robert T.; and Meharry, Murray R., 3,778,624.

Fauth, Guenter: *See—*
Winkler, Alfred; Lermann, Peter; and Fauth, Guenter, 3,777,641.
Winkler, Alfred; Lermann, Peter; and Fauth, Guenter, 3,777,642.

Fazioli, Chris T.; Sirota, Julius; and Weidener, Richard A., to National Starch and Chemical Corporation. Novel emulsion adhesive compositions of vinyl acetate polymers. 3,778,399, Cl. 260-29.6me.

Feasey, Raymond J.: *See—*
Larson, Lars M.; Feasey, Raymond J.; and Wheeler, Robert S., 3,777,451.

Federal-Moqul Corporation: *See—*
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Sherman, Vladimir Efimovich; Dubonosov, Georgy Viktorovich; Portnov, Sergei Fedorovich; Fedotov, Jury Alexeevich; Grinberg, Yakov Zeemanovich; Soloviev, Nikodim Nikiforovich; Pavlov, Viktor Grigorievich; and Dmitriev, Efim Fedorovich, 3,777,534.

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Fernandez, Reuel, to Republic National Bank of Dallas, Irving Trust Company and Union Bank, mesne. Automatic pallet lock. 3,778,012, Cl. 248-119.00r.

Fernando Fontana & C. S. a.s: *See—*
Bussi, Ennio, 3,777,473.

Ferris, Donald L., to United Aircraft Corporation. Elastomeric helicopter rotor head with dynamic and static blade coning and droop stops. 3,778,189, Cl. 416-140.000.

Fester, Walter: *See—*
Zoller, Robert; Fester, Walter; Jakob, Franz; and Dahmen, Alexander, 3,778,416.

Feuerbacher, David George; and Smith, Mary Kay Hrncir, to Texaco Inc. Oil recovery process. 3,777,818, Cl. 166-274.000.

Feuerbacher, David George; and Smith, Mary Kay Hrncir, to Texico Inc. Oil recovery process. 3,777,817, Cl. 166-274.000.

Fields, Gary D., to Eastman Kodak Company. Method and apparatus for making multiple copies from an original. 3,778,149, Cl. 355-16.000.

Finger, Eugene P., to Curtis Instruments, Inc. Operating time remaining computer. 3,778,702, Cl. 324-29.500.

Fink, Peter; and Niemeyer, Ludwig, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Roller gap control. 3,777,526, Cl. 72-35.000.

Finlay, Walter L.; Fisher, Henry J.; and Hay, Donald A., to Cooper Range Company. Copper base composition. 3,778,318, Cl. 148-12.700.

Firmenich S.A., mesne: *See—*
Becker, Joseph J.; Schulte-Elte, Karl-Heinrich; and Ohloff, Gunther, 3,778,483.

Fischer, Arthur. Circuit board and method of making the same. 3,778,745, Cl. 339-18.00c.

Fischer, Horst; and Justi, Eduard, to Licentia Patent Verwaltungs G.m.b.H. Semiconductor element and method of making it. 3,778,684, Cl. 317-234.00r.

Fischer, Rudolf, to Klockner-Humboldt Deutz Aktiengesellschaft. Recovery of lead from accumlator scrap. 3,777,994, Cl. 241-24.000.

Fisher Flouring Mills Co.: *See—*
Fisher, Glen W.; Robbins, Dewey H.; Evans, Victor J.; and Davidson, Gene E., 3,778,521.

Fisher, Glen W.; Robbins, Dewey H.; Evans, Victor J.; and Davidson, Gene E., to Fisher Flouring Mills Co. Process for the continuous production of bulgur. 3,778,521, Cl. 426-508.000.

Fisher, Henry J.: *See—*
Finlay, Walter L.; Fisher, Henry J.; and Hay, Donald A., 3,778,318.

Fisher, William J., 50% to Braverman, Maynard, mesne. Device for processing flexible metallic conduit. 3,777,351, Cl. 29-203.00h.

Fitch, Clifford E., Jr.: *See—*
Albright, Charles Jere; Fitch, Clifford E., Sr.; and Fitch, Clifford E., Jr., 3,778,524.

Fitch, Clifford E., Sr.: *See—*
Albright, Charles Jere; Fitch, Clifford E., Sr.; and Fitch, Clifford E., Jr., 3,778,524.

Fitzgerald, Carl E., to Indesco Corporation. Electrostatic painting system. 3,777,702, Cl. 118-2.000.

Fixtures Mfg. Corporation: *See—*

Snyder, Robbie L.; Spencer, Ambrose; and Butts, Harlan, 3,778,102.

Flannery, John B.; and Flannery, Paul D., to Pierson, Merlin A., mesne. Anti-collision vehicular radar system. 3,778,826, Cl. 343-7.0ed.

Flannery, Paul D.: *See—*
Flannery, John B.; and Flannery, Paul D., 3,778,826.

Fleischer, Svend Sigurd Christie; and Jeppsson, Kind Helge, to Titan Textile Machines A/S. Apparatus for individually separating heddles and like objects from a row preparatory to a drawing-in operation. 3,777,339, Cl. 28-46.000.

Fleissner, Heinz. Process for the wet-treatment of liquid permeable materials. 3,778,227, Cl. 8-151.000.

Fleming, Larry J., to Fort Howard Paper Company. Dispenser with spring-urged, automatic-stop pressure plate. 3,777,931, Cl. 221-57.000.

Flint, John Christopher Eglington: *See—*
Doydell, Kenneth Haymond; and Flint, John Christopher Eglington, 3,777,492.

Floessel, Dieter, to Aktiengesellschaft Brown, Boveri & Cie. Insulation gas-filled tubular casing structure for high-voltage conductor. 3,778,526, Cl. 174-13.000.

Flouret, George Rogelio, to Abbott Laboratories. Hexapeptide. 3,778,427, Cl. 260-112.500.

FMC Corporation: *See—*
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Folgmann, Helmut G.: *See—*
Anders, Raymond H.; and Folgmann, Helmut G., 3,778,708.

Foodice Engineering Italiana S.p.A.: *See—*
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Ford, Bacon & Davis Incorporated: *See—*
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Ford Motor Company: *See—*
Barnes, John V., 3,777,838.
Parkes, Jeffrey George Ernest, 3,777,590.
Rogerson, Jerry B., 3,778,024.

Forney, Edgar Wilmot, Jr., to AMP Incorporated. Coaxial connector. 3,778,535, Cl. 174-88.00c.

Forrest Paschal Machinery Company: *See—*
Stuart, Gerald L., 3,777,873.

Forrest, Robert L.: *See—*
Wright, James A.; and Forrest, Robert L., 3,778,218.

Forster, Hans-Joachim M.; and Hensel, Werner, to Daimler-Benz Aktiengesellschaft. Hydrodynamic brake for vehicles especially for motor vehicles. 3,777,860, Cl. 188-291.000.

Fort Howard Paper Company: *See—*
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Forward, Robert L., to Hughes Aircraft Company. Rotation-rate measuring apparatus. 3,778,163, Cl. 356-114.000.

Foshee, William H.; and Jones, Lester C. Tool for adjusting truck axle caster. 3,777,542, Cl. 72-457.000.

Fougere, Guy L.: *See—*
Brisk, Richard A.; Fougere, Guy L.; Lorah, Lawrence D.; and Pastan, Harvey L., 3,778,768.

Fountain, Gerald F., to Ponder & Best, Inc. Audible alert signal for an electronic flash unit. 3,778,672, Cl. 315-133.000.

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Fowler, Gerald: *See—*
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Foxboro Company, The: *See—*
Hanrihan, James P., 3,778,634.

Fr. Hesser Maschinenfabrik AG: *See—*
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Frame, Robert Michael Gray, to Bell-Northern Research, Ltd. Regenerative switching circuit. 3,778,642, Cl. 307-268.000.

France Neckwear Co., Inc.: *See—*
Narjarian, John, 3,777,312.

Francel, Josef; and Minneman, Lester C., to Owens-Illinois, Inc. Low temperature sealant glass for sealing integrated circuit package parts. 3,778,242, Cl. 65-43.000.

Franciscus, Leo C.: *See—*
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Frangeco, a Societe Anonyme Francaise: *See—*
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Frankiewicz, Gerhard: *See—*
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Frantisek, Jaros: *See—*
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Franzolini, Luciano: *See—*
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Fratelli Roda S.A.: *See—*
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Fredd, John V., to Otis Engineering Corporation. Pipe coupling. 3,778,089, Cl. 285-39.000.

Frederiksen, Jeffrey E., to Post Corporation. Encoder. 3,778,557, Cl. 179-90.00k.

Freixas, Antonio C. Method of manufacturing garment collars. 3,777,311, Cl. 2-143.000.

Fremiot, Charles; and Grando, Jean, to Commissariat a l'Energie Atomique. Ion source employing a microwave resonant cavity. 3,778,656, Cl. 313-63.000.

Fretwell, Richard D. Automatic electronic here is generator. 3,778,540, Cl. 178-4.10b.

Fricker, Ludwig, to Daimler-Benz Aktiengesellschaft. . 3,777,927, Cl. 220-85.00r.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Fink, Peter; and Niemeyer, Ludwig, 3,777,526.

Fried, Sidney, to Speedcheck Systems, Inc. Bag-opening dispenser and method. 3,777,439, Cl. 53-384.000.

Friedel, Murray, to Visual Graphics Corporation. Photographic composing device. 3,777,634, Cl. 95-4.500.

Friedman, Donald J. Universal shoe splint assembly. 3,777,747, Cl. 128-80.00a.

Friedman, Frank, & Sons: *See—*
Friedman, Raymond; Friedman, Sheldon; and Kalamaridis, Anthony, 3,777,684.

Friedman, Raymond; Friedman, Sheldon; and Kalamaridis, Anthony, to Friedman, Frank, & Sons. Folding mechanism. 3,777,684, Cl. 112-152.000.

Friedman, Sheldon: *See—*
Friedman, Raymond; Friedman, Sheldon; and Kalamaridis, Anthony, 3,777,684.

Frisch, Hans-Otto, to Marker, Hannes. Toe iron safety ski bindings. 3,778,076, Cl. 280-11.55t.

Fromknecht, Charles Thomas; and Davis, John C., to Singer Company, The. Moisture sealing device for toggle switches. 3,778,577, Cl. 200-168.00g.

Frost, Barry Lewis, to Clark Equipment Company. Multi-speed transmission. 3,777,594, Cl. 74-687.000.

Froster, John G.: *See—*
Johnston, Norris; and Latker, Mark, 3,777,887.

Fryfogle, James D.; and Garland, Carl C. Hand assist breather. 3,777,744, Cl. 128-28.000.

Fuchs, Francis Joseph, Jr., to Western Electric Company, Incorporated. Method of producing clad wire. 3,777,361, Cl. 29-470.600.

Fuchs, Julius Jakob, to Du Pont de Nemours, E. I., and Company. Process for the preparation of hydroxamoyl chlorides. 3,778,475, Cl. 260-566.00a.

Fuji Denki Seizo Kabushiki Kaisha: *See—*
Wakui, Toshio, 3,777,370.

Fuji Photo Film Co., Ltd.: *See—*
Sato, Masamichi; Takimoto, Masaaki; Takahashi, Isoji; and Komaki, Takao, 3,778,623.

Fuji Shashin Koki Kabushiki Kaisha: *See—*
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Fuji Xerox Co., Ltd.: *See—*
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Fujii, Yoshifusa: *See—*
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Fujimoto, Kunihiko; Matsui, Masayuki; Kishinami, Shigeto; and Nishi, Toshio, to Bridgestone Tire Company Limited. Reinforced elastomer compositions. 3,778,396, Cl. 260-27.0bb.

Fujitsuka, Kaoru; and Honda, Ko, to Fuji Xerox Co., Ltd. Apparatus and method for selectively discharging the photoconductive surface of an electrostatic drum copier to facilitate the cleaning thereof. 3,778,148, Cl. 355-15.000.

Fujiwhara, Mitsuto; Kozima, Tamotsu; Imamura, Hiroyuki; and Endo, Takaya, to Konishiroku Photo Industry Co., Ltd. Light-sensitive color photographic material with bis-type yellow color coupler. 3,778,277, Cl. 96-100.000.

Fukase, Shigeo: *See—*
Kawan, Oshio; Kudo, Mitsuhiro; Ishibashi, Masato; and Fukase, Shigeo, 3,778,260.

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Sasaki, Ryoichi; Hataya, Humio; Fukui, Yutake; and Kashimura, Tetsuo, 3,778,256.

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Funaioli, Ettore; Landini, Piercarlo; and Marella, Giulio, to Societa Italiana Resine S.p.A. Thread winding device. 3,777,995, Cl. 242-18.0dd.

Furmidge, Kenneth Frederick: *See—*
Bleson, Eric John George; Furmidge, Kenneth Frederick; Stanyon, Horace Edward; and Speller, John Rueben Thomas, 3,778,663.

Furst, Hans Joachim: *See—*
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Furst, Stefan; deceased (by Dormanns, Stefanie, nee Furst; and Furst, Hans Joachim; heirs and legal representatives). Ring and traveler. 3,777,468, Cl. 57-120.000.

Gabbard, Ova G.: *See—*
Schmidt, William G.; Gabbard, Ova G.; Hosted, John M.; and Maillet, Wilfrid G., 3,778,715.

Gabor, Eva, International, Ltd.: *See—*
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Gackstetter, Henry Clinton: *See—*
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GAF Corporation: *See—*
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Gaia, Aldino; and Urani, Angelo, to McGraw-Edison Company. Protectors for electric circuits. 3,778,740, Cl. 337-187.000.

Gallagher, William J.: *See—*

Mallozzi, Philip J.; Epstein, Harold M.; Walters, Craig T.; Applebaum, David C.; and Gallagher, William J., 3,778,585.

Gallant, William E.: *See—*
Timmons, Richard J.; and Gallant, William E., 3,778,445.

Gallay, Maurice. Traction and steering device. 3,777,898, Cl. 212-38.000.

Galuten, Jerry H.: *See—*
Castellano, Peter J.; and Galuten, Jerry H., 3,778,137.

Galvin, Lee Robert; and Kline, Arthur J., Jr., to Motorola, Inc. Carrier for beam lead integrated circuits. 3,778,686, Cl. 317-234.00r.

Gambs, Gerard C.; Nix, William H.; Barnhart, James H.; and Cathcart, John G., to Ford, Bacon & Davis Incorporated. Production of gaseous and liquid fuel from crude oil. 3,778,239, Cl. 48-214.000.

Games, John E.: *See—*
Brock, Larry D.; and Games, John E., 3,778,601.

Gamon-Calmet Industries, Inc., mesne: *See—*
Munier, Ronald A.; and Ling, Charles Che, 3,777,565.

Gampp, Robert J. Wildlife station holder. 3,777,711, Cl. 119-23.000.

Gannon, Charles R.; and Beddoe, George H., to Ashland Oil, Inc. Process for preparing rubberized bituminous paving compositions. 3,778,397, Cl. 260-28.5as.

Gant, Preston L.; Motes, Bill G.; and Aulor, Jerry T., to Continental Oil Company. Apparatus for the collection and measurement of the amount of mercury vapors present in a volume of air or other gases. 3,778,162, Cl. 356-51.000.

Garber, William Wilson. Sailing outrigger for small watercraft. 3,777,690, Cl. 114-39.000.

Gardiner, Errol Murray: *See—*
Pennington, James Ronald; and Gardiner, Errol Murray, 3,778,108.

Gardner, Charles R.; and Goelz, David W., to Republic Corporation; d/b/a Glas-Craft of California, a division of Republic Corporation. Roving counter and brake. 3,777,856, Cl. 188-65.100.

Gardner, Gary A.: *See—*
Winter, Phillip M.; and Gardner, Gary A., 3,778,241.

Gardner, Hugh R.; Ricketts, Calvin I.; and Joosten, Wesley L., to Jeter Electronic Industries, Inc. Electric animal trainer. 3,777,712, Cl. 119-29.000.

Gariety, Harold L.; Maloney, Carol J.; and Maloney, George F. Game for learning correlated facts. 3,777,415, Cl. 35-31.00f.

Garland, Carl C.: *See—*
Fryfogle, James D.; and Garland, Carl C., 3,777,744.

Garratt, Philip M., to General Electric Company. Frequency-to-voltage converter having high noise immunity. 3,778,638, Cl. 307-233.000.

Garrett, Billy J.: *See—*
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Garrett Corporation, The: *See—*
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Norman, Leslie W.; and Hunter, Skillman C., 3,777,487.

Garth, Bruce Hollis, to Du Pont de Nemours, E. I., and Company. High energy density battery having unsaturated heterocyclic solvent containing electrolyte. 3,778,310, Cl. 136-100.00r.

Gaston, Donald H.: *See—*
Whitney, Robert J.; Gaston, Donald H.; and Nickell, Joe A., 3,777,357.

Gates, David S.: *See—*
Driscoll, Gary L.; Duling, Irl N.; and Gates, David S., 3,778,487.

Gates, Marvin A.; and Sommars, Mark P., to Caterpillar Tractor Company. Fuel limiting device. 3,777,730, Cl. 123-140.00r.

Gawlick, Heinz; Bendler, Hellmut; and Jensen, Ernst, to Dyanmit Nobel Aktiengesellschaft. Anvil for percussion primer. 3,777,664, Cl. 102-45.000.

Gazuit, Georges. Tire-making drum. 3,778,326, Cl. 156-417.000.

Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H.: *See—*
Schreier, Josef; and Klimeck, Hugo, 3,777,876.

Gedanken, Aharon; Jortner, Joshua; Szoke, Abraham; and Raz, Baruch. Electrical gas discharge lamp. 3,778,661, Cl. 313-185.000.

Gehlen, Herman Walter; Hartmann, Karl; and Thieme, Gerhard, to Eisenwerke Kaiserslautern GmbH. Method of producing deep-frozen fillet blocks. 3,777,503, Cl. 62-62.000.

General Dynamics Corporation: *See—*
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Germanton, Charles E. Cylindrical geometry pushbutton combination lock. 3,777,519, Cl. 70-220.000.

Gernert, Herbert; Glockner, Hans; Meier, Ernst; Ohlschlager, Hans; and Riester, Oskar, to Agfa-Gevaert Aktiengesellschaft. Photographic material. 3,778,273, Cl. 96-84.00r.

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Giacomello, Giacomo; Pedrazzini, Andrea; and Franzolini, Luciano. System of mechanical coupling for piloting rotative transducers. 3,777,577, Cl. 74-89.220.

Gicca, Francis A.; Passavant, Francis C.; Stebbins, William W.; and Worters, Allen J., to GTE Sylvania Incorporated. Display system with graphic fill-in. 3,778,811, Cl. 340-324.0ad.

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Gillie, Robert E., to Western Electric Company, Incorporated. Apparatus for supporting and rotating a workpiece. 3,777,703, Cl. 118-49.000.

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Giordano, Arthur A.: *See—*
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Giras, Theodore C.; and Podolsky, Leaman B. Method and system for operating a boiling water reactor-steam turbine plant preferably under digital computer control. 3,778,347, Cl. 176-24.000.

Giraud, David. Particle-collecting device. 3,777,461, Cl. 56-202.000.

Girling Limited: *See—*
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Giversen, Svend, to Danfoss A/S. Meshing rotary piston machine with an internal shaft. 3,778,198, Cl. 418-61.000.

Gjettum, Dag Poppe; and Odegaard, Gunnar Viggo, to International Standard Electric Corporation. Direction finder calibration system. 3,778,834, Cl. 343-119.000.

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Glass, John P. Method of fabricating fluidic elements by assembling together a plurality of plastic strips. 3,777,344, Cl. 29-157.00r.

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Godderidge, Jean. Spooling device for unwinding wire. 3,778,003, Cl. 242-156.000.

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Goldstein, Barry. Zipper cutting apparatus. 3,777,606, Cl. 83-460.000.

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Gordy, John. Process for the electrolytic recovery of copper from its ores. 3,778,360, Cl. 204-107.000.

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Gotze, Johannes; Bockly, Erich; and Riester, Oskar, to Agfa-Gevaert Aktiengesellschaft. Sensitisation of photographic silver halide layers for the silver dye bleach process. 3,778,279, Cl. 96-140.000.

Gould, Robert W., to Cable Switch Corporation. Alarm utilizing pressure and temperature responsive switch. 3,778,805, Cl. 340-272.000.

Gowen, Inc.: *See—*
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Gowen, Remi Harold, to Gowen, Inc. Molds for use in freezing food products together with means to eject the frozen blocks from the mold frames. 3,778,216, Cl. 425-444.000.

Grace, W. R., & Co.: *See—*
Anderson, Richard F., 3,777,445.
Brown, Patrick M.; Duecker, Heyman C.; and Devore, Dorothy C., 3,778,281.

Graetz, Herbert. Multi-pocket card holder and wallet structure. 3,777,795, Cl. 150-35.000.

Graham, Charles E. Drive transmitting mechanism. 3,777,493, Cl. 60-493.000.

Graham, Joseph P. Method of separating continuous form stationery. 3,777,958, Cl. 225-4.000.

Grainger, Robert B.: *See—*
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Graves, Gail W.; Pope, Gerald R.; Stewart, Joseph T., Jr.; and Petrosky, Willard L., to Dore, John L., Co. Lined butterfly valve. 3,778,028, Cl. 251-306.000.

Gravicast Patentverwertungsgesellschaft m.b.H.: *See—*
Tenner, Oskar, 3,777,801.

Gray, Ira M. Entrance structure for a liquid conduit. 3,777,786, Cl. 138-109.000.

Gray, John F. Continuous cascade shelving assembly of knockdown character. 3,777,897, Cl. 211-55.000.

Gray, R. Flanagan; Caswell, John; and Muller, William G. Sucking wound plug and chest aspirator. 3,777,757, Cl. 128-278.000.

Great Canadian Oil Sands, Limited: *See—*
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Greathouse, Jack F., to Mack Trucks, Inc. Miniature fuel injection nozzle and holder assembly. 3,777,984, Cl. 239-533.000.

Greber, Gerd; and Schott, Herbert, to Papierwerke "Waldhof-Aschaffenburg" AG. Gels for use in gel chromatographic procedures and processes for producing the same. 3,778,393, Cl. 260-17.45g.

Grebner, Fritz; Kolsch, Wilhelm; Spindler, Gerhard; and Ehemann, Walter. Lattice girder. 3,777,433, Cl. 52-693.000.

Green, Victor J. Means for setting grommets in woven fabrics. 3,777,966, Cl. 227-61.000.

Greene, Alexander B.: *See—*
Kindlimann, Lynn E.; and Greene, Alexander B., 3,778,235.

Greenwood, Ivan A., Jr.: *See—*
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Griffith, Bobby D.: *See—*
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Grimm, Harold; and Zuckerman, Ira, to Panther Machine Corporation. Auxiliary fabric feed means for fabric spreading machine. 3,778,050, Cl. 270-31.000.

Grinberg, Yakov Zeemanovich: *See—*
Sherman, Vladimir Efimovich; Dubonosov, Georgy Viktorovich; Portnov, Sergei Fedorovich; Fedotov, Jury Alexeevich; Grinberg, Yakov Zeemanovich; Soloviev, Nikodim Nikiforovich; Pavlov, Viktor Grigorievich; and Dmitriev, Efim Fedorovich, 3,777,534.

Grodinsky, Robert M., to Chicago Musical Instrument Co. Air cooled audio amplifier assembly. 3,778,551, Cl. 179-1.000.

Grolet, Pierre: *See—*
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Grolet, Pierre; and Thiery, Jean, to Institut Francais du Petrole, des Carburants et Lubrifiants. Gripping shoe for a traction device adapted for pulling an elongated member. 3,778,094, Cl. 294-1.000.

Gronowitz, Salo Schmul; Michael, Uri; and Sjoberg, Berndt Olof Harald, to Astra Lakemedel Aktiebolag. Aromatic alpha-amino acids. 3,778,463, Cl. 260-471.00a.

Gross, Alexander. Apparatus for the production of chenille. 3,777,464, Cl. 57-24.000.

Gross, Robert A.; Hunter, Skillman C.; and Norman, Leslie W., to Garrett Corporation, The. Method and apparatus for reaction propulsion. 3,777,488, Cl. 60-204.000.

Grosseau, Albert, to Societe Anonyme Automobiles Citroen. Suspensions for vehicles. 3,778,082, Cl. 280-124.00b.

Grossman, Murray. Watch mounted counter. 3,777,475, Cl. 58-126.00b.

Grove, Marvin H.; and Griffin, Tommy K., to M & J Valve Company. Meter prover apparatus and method. 3,777,545, Cl. 73-3.000.

Groves, Harvey H. Suppository. 3,777,755, Cl. 128-271.000.

Grubb, John J.; and Tomei, Keichi, to Hamilton Company. Portable flow-through dispensing refractometer apparatus. 3,778,165, Cl. 356-128.000.

Gruber, Wolfgang: *See—*
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Gruniger, Fritz; Muller, Gunther; and Steiger, Klaus, to Loewe-Opta GmbH. Mechanism for handling magnetic tapes. 3,778,005, Cl. 242-186.000.

Grunwald, Gerhard: *See—*
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GTE Automatic Electric Laboratories Incorporated: *See—*
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GTE Sylvania Incorporated: *See—*
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Guignard, Jean-Hubert, to Schlumberger Technology Corporation. Methods and apparatus for measuring the rate of penetration in well drilling. 3,777,560, Cl. 73-151.500.

Guillen, David: *See—*
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Gulf Research & Development Company: *See—*
Gostavson, Carl A.; Shutes, Emmett B.; and Wuenschel, Paul C., 3,777,814.
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Taylor, Brian W.; and Swift, Harold E., 3,778,462.

Gullich, Reinhold, to Impex-Essen Vertrieb von Werkzeugen GmbH, Firma. Hammer drilling machine. 3,777,825, Cl. 173-13.000.

Gullo, James M.: *See—*
Pyne, William J.; Gullo, James M.; and Adams, Bobby F., 3,778,247.

Gundlach, Robert W.; and Vock, Richard C., to Xerox Corporation. Induction imaging system. 3,778,841, Cl. 346-74.0e.

Gunkel, Ronald W.: *See*—
Cole, Nancy C.; Gunkel, Ronald W.; and Houck, Clarence W., 3,778,254.

Gusaras, Vladas, to Oak Industries Inc. Multisection rotary wafer type switch assembly with interlocking stator and rotor sections. 3,778,566, Cl. 200-14.000.

Gutmann, Karl, Jr.; and Meinherz, Joachim, to Gutmann, Karl, KG, Firma. Office machine worktable construction. 3,778,125, Cl. 312-272.500.

Gutmann, Karl, KG, Firma: *See*—
Gutmann, Karl, Jr.; and Meinherz, Joachim, 3,778,125.

Habermeier, Juergen; and Porret, Daniel. Binuclear N-heterocyclic polyglycidyl compounds. 3,778,439, Cl. 260-256.40c.

Hackenberg, Robert A., to Robertson Paper Box Co., Inc. Display carton and blank forming same. 3,777,883, Cl. 206-45.310.

Hackforth, Bernhard: *See*—
Walter, Jurgen; and Hackforth, Bernhard, 3,777,865.

Haettinger, George C.: *See*—
Ericson, Alvin L.; Haettinger, George C.; and Pedersen, Ernest T., 3,777,930.

Hafele, Robert X., to Ethyl Development Corporation. Plastic container with lockable dispensing closure. 3,777,948, Cl. 222-497.000.

Haga, Teruhide: *See*—
Ushiyama, Rintaro; Sugino, Osakazu; Haga, Teruhide; and Horigome, Koichi, 3,778,268.

Hagan, Edward A. Ball rifled barrel. 3,777,385, Cl. 42-76.00r.

Hagarman, Paul O.: *See*—
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Hage, Joseph C., to Singer Company, The. Linear action knee lifters. 3,777,686, Cl. 112-237.000.

Hagen, Herrmann, to Motoren- und Turbinen-Union Munich GmbH. Control system for gas turbine engines. 3,777,479, Cl. 60-39.250.

Hagen, Magnus F.; and Jordan, Fred H. Precision telescoping ball bearing drawer slide suspension for wood and metal furniture production. 3,778,120, Cl. 308-3.800.

Hagendoorn, Johan Gerard; and Schieving, Dick, to U.S. Philips Corporation. Switching system having coded push-button. 3,778,770, Cl. 340-149.00r.

Haines, David E.; and Troutman, James D., to Troutman, James D. Magazine capacity reducer kit for repeating shotguns. 3,777,383, Cl. 42-49.00a.

Hake, Victor E.; McDowell, Allen W.; Mersel, Daniel R.; Mosher, Lawrence G.; and Stilwell, Stanley O., to International Business Machines Corporation. Logic and storage circuit for terminal device. 3,778,779, Cl. 340-172.500.

Haker, Edwin J.; and Peterson, Norman L., to Rex Chainbelt Inc. Vibration meter system for vibratory compaction machines. 3,778,177, Cl. 404-117.000.

Hakozaki, Katsuya, to Nippon Electric Company, Limited. Electronic computer comprising a plurality of general purpose registers and having a dynamic relocation capability. 3,778,776, Cl. 340-172.500.

Halcon International, Inc.: *See*—
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Hale, Dean H. Dirigible system for snowmobiles. 3,777,831, Cl. 180-5.00r.

Hale, Norman L. Three-player chess game apparatus. 3,778,065, Cl. 273-131.0ab.

Haley, David M.; and Bergantzel, Richard P., to California Car Wash Systems, Inc. Vehicle washing apparatus. 3,777,326, Cl. 15-21.00d.

Hallicrafters Co., The: *See*—
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Hamada, Nagaharu: *See*—
Hayashi, Yukitaka; Osawa, Akira; Shimizu, Hakuichi; and Hamada, Nagaharu, 3,778,793.

Hamasaki, Masafumi, to Asahi Kasei Kogyo Kabushiki Kaisha. Rider's body protecting device for high speed vehicle operable in a collision thereof. 3,778,083, Cl. 280-150.0ab.

Hamby, Clayton B., Jr., to SCM Corporation. Turpentine fraction purification. 3,778,486, Cl. 260-675.500.

Hamilton Company: *See*—
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Hamlin, Roland: *See*—
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Hamner, Glen P.; and Mason, Ralph B., to Esso Research and Engineering Company. Hydrocracking and hydrodenitrogenation of shale oil. 3,778,365, Cl. 208-111.000.

Handleman, Avron R., to Monsanto Company. Portable system for the preparation of slurries and solutions. 3,777,775, Cl. 137-268.000.

Hanke, Peter E.: *See*—
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Hannan, William James, to RCA Corporation. Gated holographic coding system for reducing alignment requirements. 3,778,128, Cl. 350-3.500.

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Hannon, Warren W.; and Hannon, Charles N., 3,777,929.

Hannon, Warren W.: *See*—
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Hannon, Warren W.; and Hannon, Charles N. (said Hannon, Charles N., assor. to said), 3,777,929.

Hannon, Warren W.; and Hannon, Charles N., to Hannon, Warren W. Method and apparatus for feeding newspapers. 3,777,907, Cl. 214-8.50f.

Hannon, Warren W.; and Hannon, Charles N., said Hannon, Charles N., assor. to said Hannon, Warren W. Newspaper vendor. 3,777,929, Cl. 221-17.000.

Hanrihan, James P., to Foxboro Company, The. Power supply with battery backup. 3,778,634, Cl. 307-64.000.

Hanseman, Leo C., to Technicolor Inc. Blue screen travelling matte system. 3,778,542, Cl. 178-5.40r.

Hansen, Paul: *See*—
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Hansen, Paul J. Metal pouring apparatus including particle collecting mechanism. 3,777,651, Cl. 98-115.00r.

Hanusiak, Tadeusz J., to Amtab Manufacturing Co. Folding table leg brace construction. 3,777,675, Cl. 108-132.000.

Haralson, Hamilton S.: *See*—
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Hardenbicker, Herbert: *See*—
Jores, Willi; Hoffacker, Franz; Kreit, Bernhardt; Lehmann, Helmut; and Hardenbicker, Herbert, 3,777,998.

Hardy, Walter N., to Rockwell International Corporation. Precision calibration target for radiometers. 3,778,837, Cl. 343-703.000.

Hargett, Lawrence W. Portable collapsible playpen. 3,777,321, Cl. 5-99.00c.

Haring, Donald R.; and King, Paul A., to Computek, Inc. Microprogrammed terminal. 3,778,775, Cl. 340-172.500.

Harlan, Alfred R., to Motorola, Inc. Mode selector disengage mechanism. 3,778,069, Cl. 274-4.00c.

Harnessed Energies, Inc.: *See*—
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Harnischfeger Corporation: *See*—
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Harper, Murry D. Tractor. 3,777,837, Cl. 180-70.00r.

Harper, Robert; and Zavadil, David, to Raytheon Company. Slow wave delay line structure. 3,778,665, Cl. 315-3.500.

Harrington, Francis E.: *See*—
Sease, John D.; and Harrington, Francis E., 3,778,348.

Harrington Manufacturing Co., Inc.: *See*—
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Harris, Elmer E.: *See*—
Smith, Richard A.; and Harris, Elmer E., 3,777,886.

Harris, Lawrence A.: *See*—
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Harris, Lawrence A., to General Electric Company. Multibeam cathode ray tube utilizing D.A.M. grid. 3,778,658, Cl. 313-69.00r.

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Harris, Robert J.; and Lee, Irvin J., to Price, H. C., Co. Apparatus for coating pipe. 3,777,705, Cl. 118-313.000.

Harrischfeger Corporation: *See*—
Witwer, Wallace J., 3,777,899.

Harrold, Ronald T., to Westinghouse Electric Corporation. Vacuum circuit interrupter having improved contact structure. 3,778,573, Cl. 200-144.00b.

Hartley, Michael Augustine; and Rowley, Robert, to Simon-Hartley Limited. Rotary distributors. 3,777,890, Cl. 210-150.000.

Hartmann, Karl: *See*—
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Harvey, Edgar Lloyd, to Burroughs Corporation. Circuit for operating multiple position display tubes. 3,778,675, Cl. 315-169.00r.

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Houston, John M.; and Kingsley, Jack D., to General Electric Company. Method and apparatus for visual imaging of ultrasonic echo signals utilizing a single transmitter. 3,778,756, Cl. 340-5.0mp.
Houston, John M., to General Electric Company. Method and apparatus for visual imaging ultrasonic echo signals utilizing multiple transmitters for reduced specular reflection effects. 3,778,757, Cl. 340-5.0mp.
Howe, William J. Method and apparatus for heat-sealing paperboard package closure flaps. 3,777,448, Cl. 53-47.000.
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Jackson, John R., to Sperry Rand Corporation. Apparatus for detecting unlevelness of a pendulously supported flux valve by subjecting the valve to a vertical magnetic field. 3,778,703, Cl. 324-43.00r.
Jackson, Raymond Pennoyer, to International Nickel Company, Inc., The. Descaling process for alloys containing chromium. 3,778,309, Cl. 134-2.000.
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Jamison, Wayne L. Transistor and diode tester. 3,778,713, Cl. 324-158.00t.
Janssen, Leopold Mathieu Lambert. Skylight and safety device. 3,777,422, Cl. 49-7.000.

Jansson, Sixten Vincent. Method of weakening strip material in section rolling processes. 3,777,530, Cl. 72-129.000.

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Jarko, Michael F.; Powers, Avery W.; and Newmeyer, Reed A., to Solid State Devices, Inc. Monitor for detecting conflicting traffic control signals. 3,778,762, Cl. 340-46.000.

Jayne, Murray L. Integrated flight indicators. 3,778,760, Cl. 340-27.0na.

Jenkins, Larry E. All purpose shoe. 3,777,324, Cl. 9-310.00d.

Jenkins, William B., to Reynolds Metals Company. Coupling construction and method and apparatus for making the same. 3,778,534, Cl. 174-88.00c.

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Johns, Raymond; and Kuhns, David G., to Safety Research and Development Inc. Turn actuated alarm system for automotive vehicles. 3,778,763, Cl. 340-55.000.

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Johnson, Kenneth O.; Kepf, Peter F.; and St. George, Alfred, to General Electric Company. Combustor casing and concentric air bleed structure. 3,777,489, Cl. 60-226.00r.

Johnson, Mark M. Ski with collapsible riding seat. 3,778,077, Cl. 280-12.00k.

Johnson, Peter D., to General Electric Company. High intensity fluorescent lamp radiating ionic radiation within the range of 1,600-2,300 A.U. 3,778,662, Cl. 313-109.000.

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Johnson, William K. Shielded cable stripper. 3,777,397, Cl. 30-90.600.

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Jones, Neal K.; Faulkner, Douglas W.; Johnston, Robert T.; and Meharry, Murray R., to Commonwealth of Australia, The. Thermal imaging device. 3,778,624, Cl. 250-333.000.

Jones, Peter Killcross, to Hawker Siddeley Aviation, Limited. Aerodynamic surfaces. 3,778,009, Cl. 244-42.0da.

Jones, Richard A.: *See*—
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Josephson, Carl A.; and Josephson, Albert R. Fire escape. 3,777,846, Cl. 182-78.000.

Josey, Alden D.; and Kirchner, Jack R., to Du Pont de Nemours, E. I., and Company. 1-Alkenyl-9,10-anthraquinones. 3,778,452, Cl. 260-369.000.

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Kallenbach, Ralph M. Motorcycle towing apparatus. 3,778,087, Cl. 280-292.000.

Kamb, Ludwig. Accident warning and traffic guide system. 3,778,764, Cl. 340-81.00r.

Kamiya, Shigeru; and Shibata, Haruo, to Matsushita Electronics Corporation. Fluorescent lamp of high color rendering. 3,778,660, Cl. 313-109.000.

Kanady, Garland H. Pipe tamping means. 3,777,766, Cl. 131-243.000.

Kanawa, Haruo, to Yuken Kogyo Company Ltd. Single body protective casing for solenoid assembly. 3,778,719, Cl. 335-278.000.

Kandatsu, Makoto; and Yamaguchi, Michio, to Tokyo Daigaku. Process for the manufacture of granular or powdery purified whole egg protein. 3,778,425, Cl. 260-112.00r.

Kanegafuchi Boseki Kabushiki Kaisha: *See*—
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Kanetake, Norio; and Shirai, Hiroshi, to Kabushiki Kaisha Kito. Process of metallic cementation. 3,778,298, Cl. 117-107.20r.

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Kanter, Michael Edward, to International Computers Limited. Universal check digit verifier/generater systems. 3,778,765, Cl. 340-146.1aj.

Kao Soap Co., Ltd.: *See*—
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Kaplan, Milton, to Sentinel Bag and Paper Co., Inc. Shoe polishing kit. 3,777,328, Cl. 15-14.940.

Karius, Siegfried, to Licentia Patent-Verwaltungs-GmbH. Solar cell generator for flight missions in the vicinity of the sun. 3,778,312, Cl. 136-89.000.

Karp, Joel A.; and Regitz, William M., to Intel Corporation. Memory system incorporating a memory cell and timing means on a single semiconductor substrate. 3,778,784, Cl. 340-173.00r.

Kasak, August: *See*—
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Kasanami, Toru; and Kano, Osamu, to Murata Manufacturing Co., Ltd. Electro-conductive material containing PBO and RuO_2. 3,778,389, Cl. 252-520.000.

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Katchka, Jay R., to Robershaw Controls Company. Flow control device. 3,777,777, Cl. 137-454.600.

Kauemann, Harold; and Lavoy, Edward S., to Houdaille Industries, Inc. Dual bend forming device and method. 3,777,529, Cl. 72-57.000.

Kaufman, William F. Spray booth and system. 3,777,706, Cl. 118-603.000.

Kawada, Takehiko, to Denki Onkyo Company, Ltd. Piezoelectric transformers. 3,778,648, Cl. 310-8.100.

Kawan, Oshio; Kudo, Mitsuhiro; Ishibashi, Masato; and Fukase, Shigeo, to Hitachi, Ltd. Superconducting materials. 3,778,260, Cl. 75-174.000.

Kayser, James H.; and Younker, Gregory A., to Minnesota Mining and Manufacturing Company. Safety closure. 3,777,924, Cl. 215-9.000.

Kearney, Stuart D., II; and Richardson, Walter, to United States of America, Navy. Rod television-guided drone to perform reconnaissance and ordnance delivery. 3,778,007, Cl. 244-3.140.

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Keller, John M. Control apparatus for selectively illuminating a group of lamps. 3,778,676, Cl. 315-217.000.

Keller, Karl H.: *See*—
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Keller, Penny C.: *See*—
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Kelley, Leon O. Plow having a reciprocating blade attachment. 3,777,500, Cl. 61-72.600.

Kelley, Oliver K., to General Motors Corporation. Method of making compound pinion gear. 3,777,615, Cl. 90-10.000.

Kelly, Joseph. Film projection with cleaning attachment. 3,778,139, Cl. 352-130.000.

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Kennedy, Brian R.; and De Vries, Louis, to Chevron Research Company. Lubricating oil additives and compositions containing such additives. 3,778,370, Cl. 252-42.00f.

Kennedy, Leroy P. Safety device requiring periodic attention of vehicle operators. 3,778,116, Cl. 303-19.000.

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Kiddon, Daniel. Multi-purpose closure. 3,777,950, Cl. 222-554.000.

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Kightlinger, Adrian P.; Crosby, Edward K.; and Speakman, Edwin L., to Standard Brands Incorporated. Gelatinizable crosslinked cationic starch and method for its manufacture. 3,778,431, Cl. 260-233.30r.

Kihara, Nobutoshi; and Odagiri, Yoichi, to Sony Corporation. Rotary head magnetic recording and reproducing apparatus with pliant record disk in still reproduction of video signals. 3,778,559, Cl. 178-6.6fs.

Kiley, Leo R., to Teledyne Industries, Inc. Internal combustion engine having a variable volume precombustion chamber. 3,777,724, Cl. 123-78.00b.

Killen, Gene W., to Pyott-Boone, Inc. Multi-station safety monitor having shunt switch. 3,778,797, Cl. 340-227.00r.

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Kimura, Tomiaki; Ohmura, Yasuhiro; Yoshimura, Tamotsu; Kohyama, Katsuhisa; and Watanabe, Kenzo, to Abrac Corporation and Mitsubishi Chemical Industries Limited. Polymerization of 2-pyrrolidone using a catalyst formed by reaction between 2-pyrrolidone and aueous KOH. 3,778,402, Cl. 260-78.00p.

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Kirk, Joseph Pennell, to International Business Machines Corporation. Structure for making phase filters. 3,777,633, Cl. 95-1.00r.

Kirton, Kenneth T., to Upjohn Company, The. Use of prostaglandins to induce medical abortion. 3,778,506, Cl. 424-318.000.

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Kissa, Erik, to Du Pont de Nemours, E. I., and Company. Durable-press and soil-release compositions. 3,778,226, Cl. 8-115.500.

Kitagawa, Norihisa, to Texas Instruments, Incorporated. IGFET dynamic address decode circuit. 3,778,782, Cl. 340-173.00r.

Kitamura, Yoshiaki: *See*—
Iwai, Shigeru; and Kitamura, Yoshiaki, 3,777,618.

Kitchell, Bruce N.: *See*—
Danehy, Robert P.; Kitchell, Bruce N.; and Silva, Antonio V., 3,777,524.

Kjulvya, Leopold Yakobovich: *See*—
Tooming, Khugo Gustavovich; Kjulvya, Leopold Yakobovich; Gorschenin, Eduard Andreevich; and Nevalins, Arnold Yanovich, 3,777,682.

Kleiman, Joseph P.; and Plonsker, Larry, to Ethyl Corporation. Complex ester. 3,778,454, Cl. 260-404.800.

Kleinschmidt, Ernst, to Herbol-Werke Herbig-Haarhaus Aktiengesellschaft. Continuous measurement of viscosity. 3,777,550, Cl. 73-59.000.

Klema, Kenneth G., to Johnson, S. C., & Son, Inc. Reciprocating valve assembly for pressurized containers. 3,777,947, Cl. 222-402.230.

Klemchuk, Peter. Substituted hydroxylamine anti-oxidants. 3,778,464, Cl. 260-482.00p.

Klenz, Karl A.; and Velarde, Clyde R., to Rheem Manufacturing Company. Clipping apparatus and clips therefor. 3,777,400, Cl. 206-56.0ab.

Klimeck, Hugo: *See—*
Schreier, Josef; and Klimeck, Hugo, 3,777,876.

Kline, Arthur J., Jr.: *See—*
Galvin, Lee Robert; and Kline, Arthur J., Jr., 3,778,686.

Klockner-Humboldt Deutz Aktiengesellschaft: *See—*
Fischer, Rudolf, 3,777,994.

Klotzer, Erhard; and Pochert, Johannes, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for improving adherence of rubber mixtures to textile fabrics. 3,778,406, Cl. 260-41.50a.

Knapp, Heinrich; and Jaggle, Gunther, to Bosch, Robert, G.m.b.H. Fuel injection apparatus. 3,777,726, Cl. 123-119.00r.

Knapp, Lowell W., to Xerox Corporation. Illuminating apparatus. 3,778,146, Cl. 355-3.000.

Knoll International, Inc.: *See—*
Christen, Andreas, 3,777,437.

Knutson, Carroll F.: *See—*
Boardman, Charles R.; and Knutson, Carroll F., 3,777,815.

Kobayashi, Akira; Sugano, Tadashi; Koike, Toshio; and Sakata, Minehiro, to Iwatsu Electric Co., Ltd. Charging apparatus for electro-photographic copying machines. 3,778,622, Cl. 250-324.000.

Kobayashi, Masayoshi; and Uchino, Mitsuo, to Diesel Kiki Kabushiki Kaisha. Fuel injection system in a distributor-type injection pump for internal combustion engine. 3,777,731, Cl. 123-140.0fg.

Kobayashi, Yoshikazu: *See—*
Matsuoka, Michio; Kobayashi, Yoshikazu; Itakura, Gen; and Masuyama, Takeshi, 3,778,743.

Kobe Steel Ltd.: *See—*
Aiko, Hideo; Okamoto, Takao; Abe, Eiji; Tsukihashi, Kazunobu; and Yamashita, Koichi, 3,777,661.

Kober, Drago, to Liquid Gas Anlagen Union GmbH. Process and apparatus for purging gas-containing storage tanks in vessels. 3,777,928, Cl. 220-88.00b.

Koch, Karl E., to Sperry Rand Corporation. Steering mechanism for hydrostatically driven agriculture machines. 3,777,833, Cl. 180-6.480.

Koehler, Dale R.; Zupfer, Jerrald A.; and Prak, Jan Willem L., to Bulova Watch Company, Inc. Presettable frequency divider for electronic timepiece. 3,777,471, Cl. 58-23.00r.

Koehring Company: *See—*
Nicholson, Robert D., 3,777,784.
Tolbert, William N., 3,777,773.

Koenders, Elisabeth. Packing machine. 3,777,452, Cl. 53-206.000.

Koerner, Roger J.: *See—*
Burkhardt, Joseph A.; Childers, Thomas W.; Koerner, Roger J.; Mason, John P.; and Tidwell, Danny R., 3,777,812.

Koester, David W.: *See—*
Cornelius, Edward B.; and Koester, David W., 3,778,388.

Kofink, Siegfried, to Eberspacher, J. Space heater having a heating air flow duct with a heat exchanger for engine cooling water and one for combustion gases. 3,777,975, Cl. 237-12.30a.

Kohkoku Chemical Industry Co., Ltd.: *See—*
Iizuka, Toru; Ionooka, Katsuo; Saitoh, Torahiko; and Yasuda, Isao, 3,778,590.

Kohler, William L.: *See—*
Hause, Gilbert K.; and Kohler, William L., 3,777,622.

Kohlhammer, Bernd, to Licentia Patent-Verwaltungs-G.m.b.H. Filter circuit. 3,778,644, Cl. 307-295.000.

Kohyama, Katsuhisa: *See—*
Kimura, Tomiaki; Ohmura, Yasuhiro; Yoshimura, Tamotsu; Kohyama, Katsuhisa; and Watanabe, Kenzo, 3,778,402.

Koike, Toshio: *See—*
Kobayashi, Akira; Sugano, Tadashi; Koike, Toshio; and Sakata, Minehiro, 3,778,622.

Kokkola, Seppo J.; and Lassila, Veikko A. Forging machine. 3,777,543, Cl. 72-465.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Watanabe, Teruji; and Ishihara, Hideo, 3,778,789.

Kolb, James M.; and O'Leary, Kevin J., to Electronor Corporation, mesne. Cobalt metatitanate-modified solid solution. 3,778,363, Cl. 204-290.00f.

Kollar, John, to Halcon International, Inc. Process for preparing ethylene glycol esters. 3,778,468, Cl. 260-497.00r.

Kolsch, Wilhelm: *See—*
Grebner, Fritz; Kolsch, Wilhelm; Spindler, Gerhard; and Ehemann, Walter, 3,777,433.

Komaki, Takao: *See—*
Sato, Masamichi; Takimoto, Masaaki; Takahashi, Isoji; and Komaki, Takao, 3,778,623.

Konijn Machine Bouer: *See—*
Konijn, Nicolaas Gerardus, 3,777,919.

Konijn, Nicolaas Gerardus, to Konijn Machine Bouer. Mobile excavator. 3,777,919, Cl. 214-147.00g.

Konishiroku Photo Industry Co., Ltd.: *See—*
Fujiwhara, Mitsuto; Kozima, Tamotsu; Imamura, Hiroyuki; and Endo, Takaya, 3,778,277.
Ushiyama, Rintaro; Sugino, Osakazu; Haga, Teruhide; and Horigome, Koichi, 3,778,268.

Konno, Toshio: *See—*
Mizuno, Hideaki; Konno, Toshio; and Akiyama, Naoki, 3,778,266.

Kono, Minoru: *See—*
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Konyaev, Jury Sergeevich: *See—*
Vereschagin, Leonid Fedorovich; Konyaev, Jury Sergeevich; Polyakov, Evgeny Valentinovich; and Surkov, Ivan Efimovich, 3,778,196.

Kopf, Gerhard; and Muller, Adolf, to Siemag Siegener Maschinenbau GmbH. Shear for metal plate. 3,777,608, Cl. 83-517.000.

Kornis, Gabriel; and Nidy, Eldon G., to Upjohn Company, The. Organic compounds and process. 3,778,473, Cl. 260-553.00a.

Korteling, Aart Gerrit, to U.S. Philips Corporation. Pulse-to-revolution converter for converting a variable pulse frequency into a proportional rotation speed of a shaft. 3,778,693, Cl. 318-314.000.

Koser, Robert F. Silo door construction. 3,777,429, Cl. 52-196.000.

Kovach, Stephen M.; and Patrick, Ralph E., to Ashland Oil, Inc. Method and recovery of benzene and toluene. 3,778,484, Cl. 260-674.00r.

Kovar, George F., to Hallicrafters Co., The. Double ridged wave guide feed for signal antenna. 3,778,839, Cl. 343-772.000.

Kozima, Tamotsu: *See—*
Fujiwhara, Mitsuto; Kozima, Tamotsu; Imamura, Hiroyuki; and Endo, Takaya, 3,778,277.

Kozlow, Woodruff J. Snowmobile ski 280/028.000. 3,778,074, Cl. .

Krauch, Carl Heinrich; and Sanner, Axel, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of polymers with a fibrous structure. 3,778,294, Cl. 117-93.310.

Kraus, Kurt A., to United States of America, Atomic Energy Commission. Process for treatment of aqueous suspensions. 3,778,366, Cl. 210-23.000.

Kraver, Theodore C.: *See—*
Reichenbacher, Frank W.; Kraver, Theodore C.; and Hope, Edward F., 3,777,599.

Kreis, Philipp. Handle for fast action valve. 3,778,026, Cl. 251-255.000.

Kreit, Bernhardt: *See—*
Jores, Willi; Hoffacker, Franz; Kreit, Bernhardt; Lehmann, Helmut; and Hardenbicker, Herbert, 3,777,998.

Krekeler, Claude B., to Cincinnati Mine Machinery Co., The. Anti-coring device for use with bit mounting means on mining, earth working and digging machines. 3,778,112, Cl. 299-86.000.

Krenzer, John; and Richter, Sidney B., to Velsicol Chemical Corporation. Fungicidal method utilizing furancarboxamides. 3,778,512, Cl. 424-285.000.

Kriege, Richard P., to Lowrance Electronics Mfg. Corporation. Inverter ballast circuit. 3,778,677, Cl. 315-219.000.

Krohne, Ludwig: *See—*
Engelhardt, Helmut, 3,778,091.

Kruiswijk, Franciscus J.: *See—*
Van Der Waaij, Dirk; Erkelens, Hendrik J.; Bossers, Pieter A.; and Kruiswijk, Franciscus J., 3,777,736.

Krulee, Alfred W., to Norris Industries, Inc. Combined charging and pressure indicating device. 3,777,569, Cl. 73-389.000.

Kruner, Rolf; Thillen, Hans; and Grunwald, Gerhard. Rod entry guide. 3,777,964, Cl. 226-183.000.

Kruschinski, John H.: *See—*
Henkel, Robert N.; and Kruschinski, John H., 3,778,404.

Kruuger, Evgeny Adolfovich: *See—*
Maslenok, Boris Arkadievich; Zlobin, Viktor Grigorievich; Khegai, Anatoly Sergeevich; Nikolaev, Vladimir Petrovich; and Kruuger, Evgeny Adolfovich, 3,778,345.

Ku, Daniel Y. C., to Gulf Research & Development Company. Process for preparing a monoalkyl aromatic. 3,778,415, Cl. 260-67.20t.

Kubli, Robert A.; Sasse, Frederick H.; Uttrachi, Gerald D.; Van Dyke, Le Roy L.; and Nakabayashi, Masahiro, to Union Carbide Corporation. Cored wire electrode having 200 to 2000 ppmO_2. 3,778,587, Cl. 219-146.000.

Kubo, Shuji; and Naito, Hiroshi, to Matsushita Electric Industrial Company. Target having a mosaic made up of a plurality of P-N junction elements. 3,778,657, Cl. 313-65.00a.

Kucera, Jaromir, to Zellweger AG. Method of and apparatus for generating signals. 3,778,726, Cl. 328-223.000.

Kuck, Ewald D. Apparatus for erecting concrete structures. 3,778,204, Cl. 425-63.000.

Kudo, Mitsuhiro: *See—*
Kawan, Oshio; Kudo, Mitsuhiro; Ishibashi, Masato; and Fukase, Shigeo, 3,778,260.

Kuellgren, Ove Allan Valentin, to Alfa-Laval AB. Sludge centrifuge. 3,777,972, Cl. 233-20.00a.

Kugelfischer Georg Schafer & Co.: *See—*
Kirchner, Willi; and Braune, Gerhard, 3,777,727.

Kuhfuss, Herbert F.; and Jackson, Winston J., Jr., to Eastman Kodak Company. Process for preparing a final copolyester by reacting a starting polyester with an acyloxy aromatic carboxylic acid. 3,778,410, Cl. 260-47.00c.

Kuhlman, Ora Florentine: *See—*
Andrews, Del; and Kuhlman, Ora Florentine, 3,777,498.

Kuhlmann, Wayne: *See—*
Manier, Francis Rene Daniel, 3,778,282.

Kuhns, David G.: *See—*
Johns, Raymond; and Kuhns, David G., 3,778,763.

Kukhermann, Gustav, to Windmoller & Holscher. Apparatus for forming and conveying stacks of flat articles, especially sheet articles. 3,777,903, Cl. 214-6.00h.

Kume, Yoshiharu: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Hirohashi, Toshiyuki; Yamamoto, Michihiro; Ishizumi, Kikuo; Akatsu, Mitsuhiro; Maruyama, Isamu; Kume, Yoshiharu; Mori, Kazuo; and Izumi, Takahiro, 3,778,433.

Kundisch, Heinrich R.; and Pfundstein, Werner K., to Irion & Vosseler. Zero setting roller counting mechanism. 3,777,973, Cl. 235-144.0hc.

Kunkle Valve Co., Inc.: *See—*
Beck, Maurice E., 3,777,783.

Kuramato, Yoshio; Tjujimoto, Kayoshi; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Automatic exposure control device for a photographic camera. 3,777,637, Cl. 95-10.0cd.

Kuraray Co., Ltd.: *See—*
Yano, Masayuki; Yamamoto, Iwao; and Yasuhira, Nobuo, 3,778,498.

Kurimoto, Mikishi; and Asano, Hiroaki, to Toyoda Koki Kabushiki Kaisha. Grinding machine. 3,777,441, Cl. 51-105.0sp.

Kurita, Yoshio: *See—*
Yamasaki, Hiroo; Kurita, Yoshio; and Ito, Ichizo, 3,777,563.

Kurokawa, Junji: *See—*
Arai, Fumiaki; Ohta, Wasaburo; Kurokawa, Junji; Osui, Noriyuki; Shimizu, Sakae; and Tanaka, Tetsuo, 3,778,263.
Arai, Fumiaki; Ohta, Wasaburo; Kurokawa, Junji; Osui, Noriyuki; Shimizu, Sakae; and Tanaka, Tetsuo, 3,778,264.

Kushner, Irwin: *See—*
Heifetz, Saul; Mandelbaum, George; and Kushner, Irwin, 3,778,528.

Kusters, Heinz Peter, to Porsche, Dr.-Ing. H.c.F., K.G., Firma. Seat consisting of seat portion and backrest, especially driver seat for motor vehicles. 3,778,104, Cl. 297-458.000.

Kuth, Robert; Hildebrand, Dietrich; and Bien, Hans-Samuel, to Bayer Aktiengesellschaft. Process for the continuous dyeing and printing of fibre materials of synthetic polyamides. 3,778,228, Cl. 8-174.000.

Kuze, Yoshikazu. Thermal responsive power element. 3,777,495, Cl. 60-530.000.

Kwok, Clyde Chi Kai, to Rippingille, Edward V., Jr. Pulsating dental syringe. 3,777,746, Cl. 128-66.000.

Kyowa Hakko Kogyo Co. Ltd.: *See—*
Shiga, Akio; and Ishida, Kengo, 3,778,513.

Kyriakides, Stavros A. Protection of rubber surfaces from oxidation effects. 3,778,286, Cl. 106-287.00r.

Laarman, Johannes Bertus, to N.V. Industrieele Handelscombinatie Holland. Cutter suction dredge having parallelogram linkage wave compensator. 3,777,372, Cl. 37-64.000.

Ladd, Floyd R., to Townsend Engineering Company. Method of embedding thin wall tubular material in plastic under high pressure conditions. 3,778,496, Cl. 264-162.000.

Lagen, William S. Apparatus and technique for incinerating solid fuels containing carbonizable material. 3,777,676, Cl. 110-8.00r.

Lakeman, Thomas Ashley. Target for use on water or land. 3,778,060, Cl. 273-102.00s.

Lamb, Gilbert C., Jr.: *See—*
Samalon, Eugene J.; Lamb, Gilbert C., Jr.; and Lentz, Ervin C., 3,777,852.

Lamp, William F.: *See—*
Weisselberg, Edward B.; Worden, George M., Sr.; Lamp, William F.; and Lane, Alexander M., 3,777,409.

Land, Edwin H., to Polaroid Corporation. Photographic apparatus and method for treating photographic materials with a liquid. 3,777,647, Cl. 95-89.001.

Land, Edwin H., to Polaroid Corporation. Photographic system comprising film cassette including self-contained processing apparatus and film drive and projection system controlled thereby. 3,778,140, Cl. 352-130.000.

Land, Edwin H., to Polaroid Corporation. Photographic products and processes. 3,778,265, Cl. 96-3.000.

Land, Edwin H., to Polaroid Corporation. Photographic products comprising an opacifying agent in association with a reflecting agent. 3,778,271, Cl. 96-77.000.

Landel, Robert F.: *See—*
Rembaum, Alan; Landel, Robert F.; and Keyzer, Hendrik, 3,778,476.

Lander, James E.: *See—*
Lutes, Kenneth V.; Lander, James E.; Shanahan, Vincent J.; and Mills, Richard G., 3,777,678.

Landini, Piercarlo: *See—*
Funaioli, Ettore; Landini, Piercarlo; and Marella, Giulio, 3,777,995.

Lane, Alexander M.: *See—*
Weisselberg, Edward B.; Worden, George M., Sr.; Lamp, William F.; and Lane, Alexander M., 3,777,409.

Lane, Donald W.; and Pemberton, Troy J., to Phillips Petroleum Company. Modified on-off control. 3,778,025, Cl. 251-129.000.

Lane, Robert, to Platt International Limited. Open-end textile spinning machines. 3,777,329, Cl. 15-301.000.

Lang, Robert J.; Holt, Eugene L.; and Stoneback, David N., to Esso Research and Engineering Company. Regeneration of flue gas desulfurization sorbents. 3,778,501, Cl. 423-244.000.

Lange, Karl Heinz, to Bolda Werka Photographische Gerate und Kunststoff R. Gruter Kommanditgesellschaft. Camera casing assembly. 3,777,639, Cl. 95-11.00r.

Langlois, Christian, to Regie Nationale des Usines Renault. Device for pre-balancing unbalanced masses on crankshafts. 3,777,340, Cl. 29-1.00d.

Langston, Perry R., Jr.; Tummala, Rao R.; and Wilson, Donald M., to International Business Machines Corporation. Sealing technique for gas panel. 3,778,127, Cl. 316-20.000.

Lannert, James W.: *See—*
Driscoll, Richard P.; Lannert, James W.; and Beaver, Donald V., 3,778,014.

Lapin, Zeverly L.: *See—*
Christensen, Frank G.; and Wolff, Rafael I., 3,777,830.

Larkin, Sam, to Spring Associates, Inc. Spring base and method of forming same. 3,777,322, Cl. 5-267.000.

Larson, Lars M.; Feasey, Raymond J.; and Wheeler, Robert S., to Eastman Kodak Company. Apparatus for making and filling liquid containing pods. 3,777,451, Cl. 53-180.000.

Larson, Lawrence L.: *See—*
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Laser Systems & Electronics, Inc.: *See—*
Hines, Rubin H.; Hollinshead, William L.; and Bolden, Thomas O., 3,778,159.

Laskowski, Kenneth W., to Xerox Corporation. Photodetection of non-opaque objects transported along a conveyor by use of a light blocking opaque flap. 3,778,618, Cl. 250-223.000.

Lassila, Veikko A.: *See—*
Kokkola, Seppo J.; and Lassila, Veikko A., 3,777,543.

Latker, Mark: *See—*
Johnston, Norris; and Latker, Mark, 3,777,887.

Laube, Max, to Swiss Aluminium Ltd. Apparatus for cleaning the exhaust air from workshops. 3,777,457, Cl. 55-223.000.

Laubman, Harry A. Aircar. 3,777,842, Cl. 180-117.000.

Lavigne, Jean. Pad of stacked detachable sheets, a method and elements for manufacturing the same. 3,778,324, Cl. 156-257.000.

Lavoy, Edward S.: *See—*
Kauemann, Harold; and Lavoy, Edward S., 3,777,529.

Law, William J. H. Beverage container having a frangible closure. 3,777,968, Cl. 229-7.00r.

Lawless, Thomas R. Coupling plate. 3,777,847, Cl. 184-1.00r.

Lawlor, John E.; and Sgombick, John, to Xerox Corporation. Educational device. 3,777,412, Cl. 35-19.00r.

Lazzery, Angelo Gino, to RCA Corporation. Damping means for ultrasonic transmitters. 3,777,700, Cl. 116-137.00a.

LCC CICE-Compagnie Europeene des Composants Electronique: *See—*
Steenmetser, Jean Louis, 3,778,735.

Le Bourgeois, Andre Edouard Henri. Releasable locking device for immobilizing a member carried by a cable. 3,777,425, Cl. 52-2.000.

Le Martret, Odile: *See—*
Clemence, Francois; and Le Martret, Odile, 3,778,504.

Le Tourneau, R. G., Inc.: *See—*
Molby, Lloyd A., 3,778,174.

Le Van, Wayne P. Method for cooking strips of meat. 3,778,523, Cl. 426-510.000.

Lear Siegler, Inc.: *See—*
Bise, Donald L.; and Surprenant, Ronald J., 3,778,563.

Leavitt, Minard A., to Cutler-Hammer, Inc. Method and apparatus for reducing optical interference patterns recorded by contact printers. 3,778,155, Cl. 355-91.000.

Lee, Harold Barry, to Bond's Wear Pty. Limited. Apparatus for manufacturing loops of elasticised material. 3,777,683, Cl. 112-121.270.

Lee, Irvin J.: *See—*
Harris, Robert J.; and Lee, Irvin J., 3,777,705.

Lee, Raymond, Organization, Inc., The: *See—*
Miller, Clifford J., 3,777,735.

Leeney, Timothy John: *See—*
Brown, Edward Douglas; and Leeney, Timothy John, 3,778,461.

Leevers, Jack E., to National Building Industries. Interior marine door and frame. 3,777,693, Cl. 114-117.000.

Lehmann, Helmut: *See—*
Jores, Willi; Hoffacker, Franz; Kreit, Bernhardt; Lehmann, Helmut; and Hardenbicker, Herbert, 3,777,998.

Lehuen, Christian; and Gillet, Roger, to Societe Generale de Constructions Electriques et Mecaniques (Alsthom). Rotor winding for electrical machines with grooved conductors. 3,778,649, Cl. 310-61.000.

Leidl, Jacob John. Tethered bowling pin apparatus with felled pin sensors controlling operation thereof. 3,778,057, Cl. 273-44.000.

Leisenberg, Manfred. Conveying- and drying-apparatus for ceramic members. 3,777,407, Cl. 34-105.000.

Leistner, Werner, to Siemens Aktiengesellschaft. Electric salient-pole machine. 3,778,647, Cl. 310-54.000.

L'Electro-Refractaire: *See—*
Recasens, Joseph; Blanchet, Pierre; and Duchenoy, Jacques, 3,777,805.

Lemons, Carl Robert, to McDonnell Douglas Corporation. Fabrication of three-dimensional reinforced insulation blocks. 3,778,492, Cl. 264-45.000.

Lenco, Inc.: *See—*
Colman, William H., Jr., 3,777,687.

Lenger, Karl Werner: *See—*
Csaky, Thaddeus G.; and Lenger, Karl Werner, 3,777,722.

Lentz, Ervin C.: *See—*

Samalon, Eugene J.; Lamb, Gilbert C., Jr.; and Lentz, Ervin C., 3,777,852.

Lermann, Peter: *See—*
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Winkler, Alfred; Lermann, Peter; and Fauth, Guenter, 3,777,642.

Lerouge, Claude Paul Henri: *See—*
Colardelle, Joel Serge; Lerouge, Claude Paul Henri; and Regbuer, Marc Andre, 3,778,734.

Less, Frank L.: *See—*
Pease, Richard R.; Blitzer, Frank; Giordano, Arthur A.; and Less, Frank L., 3,778,166.

Levellers, A. M., and I., Ltd.: *See—*
Best, Donald Edward, 3,777,694.

Lever Brothers Company: *See—*
Anderson, James Iain Walker; Marr, Donald Henry Albert; and Phillips, Graham Chesterton, 3,777,709.
Copier, Harald; and Tonsbeek, Christiaan Herman Theodoor, 3,778,518.

Levesque, George N., to Brown & Sharpe Manufacturing Company. Slide guide having preloaded hollow and solid roller bearings. 3,778,121, Cl. 308-6.00r.

Levy, Hans: *See—*
Schade, John Alan; and Levy, Hans, 3,778,042.

Lewandowski, Raymond F.; and Markison, William C., to Oak Industries Inc. Power rated pushbutton switch with slide bar and washer type blockout interlock structure. 3,778,565, Cl. 200-5.00e.

Lewellen, William B. Aesthetic fluid suspension and its preparation. 3,777,379, Cl. 40-106.210.

Lewicki, George W.; and Gotsinger, John E., to United States of America, National Aeronautics and Space Administration. Thermomagnetic recording and magneto-optic playback system having constant intensity laser beam control. 3,778,791, Cl. 340-174.10m.

Lewis, Geoffrey, to Lucas, Joseph, (Industries) Limited. Fuel control apparatus for gas turbine engine. 3,777,483, Cl. 60-39.28r.

Lewis, Harold Loyd, to Cotton, Incorporated. Control of fungi on cotton plants. 3,778,509, Cl. 424-343.000.

Lewis, Homer D.: *See—*
Baker, Richard D.; Hayter, Sidney W.; and Lewis, Homer D., 3,778,380.

Lewis, John R., to Harnessed Energies, Inc. Faraday effect speedometer. 3,777,561, Cl. 73-181.000.

Lewis, Jules. Case for removably carrying a wrist watch. 3,777,953, Cl. 224-4.00e.

Ley, Kurt: *See—*
Oertel, Harald; Roos, Ernst; and Ley, Kurt, 3,778,409.

Liberman, Milton. Recessed lighting fixture. 3,778,609, Cl. 240-73.0ha.

Licentia Patent Verwaltungs G.m.b.H.: *See—*
Fischer, Horst; and Justi, Eduard, 3,778,684.

Licentia Patent-Verwaltungs-GmbH: *See—*
Karius, Siegfried, 3,778,312.
Kohlhammer, Bernd, 3,778,644.

Lidkea, Harrison B.: *See—*
MacNeill, John H.; Bellinger, James E.; Lidkea, Harrison B.; and Seib, Kenneth L., 3,777,417.

Liermann, Peter, to Bosch, Robert, G.m.b.H. High-speed print-out arrangement using continuously rotating step motor. 3,778,777, Cl. 340-172.500.

Lightolier Incorporated: *See—*
Wyles, Walter E., 3,777,432.

Liloia, Gerald J.: *See—*
Mesek, Frederick K.; Shepherd, Robert C.; Strickel, William R.; Liloia, Gerald J.; May, Louis F., Jr.; and Schiff, Norman, 3,777,758.

Lindemann, Robert W.; and Parmley, John W., to Cutler-Hammer, Inc. Square wave rotary pulse transducer. 3,778,620, Cl. 250-232.000.

Lindsay, Anthony; Imperati, Ronald Lee; and Becker, Philipp, to Sperry Rand Corporation. Power transmission. 3,778,202, Cl. 418-206.000.

Linc, Lawrence L.: *See—*
Butler, Eugene B.; Fak, Ivan A.; and Linc, Lawrence L., 3,778,332.

Ling, Charles Che: *See—*
Munier, Ronald A.; and Ling, Charles Che, 3,777,565.

Lingens, Paul; and Martin, Gerhard, to Dynamit Nobel Aktiengesellschaft. Effect of the shock pressure of explosive charges. 3,777,662, Cl. 102-23.000.

Link, William T.; and Portner, Peer M., to Arkon Scientific Laboratories. Solenoid actuators and generators and method of using same. 3,778,697, Cl. 322-3.000.

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Longuemare, R. Noel, Jr.; and Mooney, David H., Jr., to Westinghouse Electric Corporation. Guarded monopulse radar system. 3,778,829, Cl. 343-16.00r.

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Luraschi, Marisa. Apparatus for molding thermoplastic laminate, shoving strip variegations. 3,778,207, Cl. 425-131.000.

Luscher, Werner P.; and Schoenman, Leonard, to Aerojet-General Corporation. Cooling passages wafer blade assemblies for turbine engines, compressors and the like. 3,778,183, Cl. 415-115.000.

Lustig, Claude D., to Sperry Rand Corporation. D.C. gas discharge display apparatus with pulse train memory sustaining potential. 3,778,674, Cl. 315-169.00r.

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Meeks, Merrtt R.; Monroe, Roger F.; and Weber, Richard M., to Dow any, The. Suspensonolyred pl chloride beads as vapor pressure depressants. 37,779,341, Cl. 222-3.000.
Mees, James G.; Lubarsky, Andre, Jr.; and Tahara, Goro R., to Telecommunication Technology, Inc. Telephone signaling and testing apparatus for either pulse or multifrequency dialing. 3,778,556, Cl. 179-90.00k.
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Metzger, Hans; Brill, Klaus; and Hornung, Friedrich, to Bosch, Robert, G.m.b.H. Foil for gas diffusion electrodes for electrochemical cells and process of making the same. 3,778,311, Cl. 136-120.0fc.

Metzger, Lenard M.; and Babcock, David L., to Eastman Kodak Company. Film scanning for television reproduction. 3,778,545, Cl. 178-7.200.

Meyers, Calvin E., to Bug-Lok Corporation. Apparatus for locking gear shift stick and handbrake lever of a motor vehicle. 3,777,518, Cl. 70-200.000.

Michael, Uri: *See—*
Gronowitz, Salo Schmul; Michael, Uri; and Sjoberg, Berndt Olof Harald, 3,778,463.

Michel, Edmond; and Minsart, Maurice, to Solvay & Cie. Device for trimming the bottom of hollow plastic bodies produced by blow molding. 3,777,609, Cl. 83-635.000.

Michell, Joseph H. Spring type ball projecting device with ball throwing time delay mechanism. 3,777,733, Cl. 124-7.000.

Michie, James C., III; and Calvert, Richard C. M., III, to Newport News Shipbuilding and Dry Dock Company. Method of transporting liquid and gas. 3,777,502, Cl. 62-55.000.

Michigan State University, The Board of Trustees of: *See—*
Mortland, Max M.; and Doner, Harvey E., 3,778,457.

Micro Devices Corporation: *See—*
Merrill, Phillip Edward, 3,778,742.

Micromedic Systems, Inc.: *See—*
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Midle, Karl F., Jr. Heating and cooling device and method. 3,777,809, Cl. 165-54.000.

Migitaka, Masatoshi: *See—*
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Mikajiri, Akio, to Nihon Denshi Kabushiki Kaisha. Specimen tilting device for an electron optical device. 3,778,621, Cl. 250-442.000.

Miller, Arthur J.; and Miller, Robert A., to Carrier Corporation. Turbocharger structure. 3,778,194, Cl. 417-407.000.

Miller, Bernard G., to Allis-Chalmers Corporation. Rose guide for lift truck. 3,777,853, Cl. 187-9.000.

Miller, Clifford J., 20% to Lee, Raymond, Organization, Inc., The. Decorative fireplace. 3,777,735, Cl. 126-120.000.

Miller, Frederick L. B., to Chipper Machines and Engineering Corporation. Knife holder in log slabbing chipper. 3,777,793, Cl. 144-225.000.

Miller, Imrich M., to Universal Manufacturing Corporation. Moisture-resistant housing for electrical components and method and apparatus for making the same. 3,778,529, Cl. 174-52.0pe.

Miller, J. H., Jr.: *See—*
Fair, Delbert W.; Brown, Graydon L.; and Miller, J. H., Jr., 3,777,843.

Miller, Richard A., to Antemacraft Company. Clip device for mounting accessory on an antenna boom. 3,778,537, Cl. 174-138.00r.

Miller, Robert A.: *See—*
Miller, Arthur J.; and Miller, Robert A., 3,778,194.

Miller, Roy W.; Stark, Marvin; and Shaver, William R., to Pullman Incorporated. Railroad flat car. 3,777,671, Cl. 105-420.000.

Millet, Marcus J., to Eastman Kodak Company. Camera cocking mechanism. 3,777,644, Cl. 95-31.0ac.

Milligan, Gene Emmett; Ho, Henry Minglo; and Kimura, Noboru, to Control Data Corporation, mesne. Blanking circuit for high resolution data recovery systems. 3,778,792, Cl. 340-174.10h.

Milligan, James Paul; and Milligan, Judy Anne. Symbol recognition teaching device. 3,777,416, Cl. 35-31.00c.

Milligan, Judy Anne: *See—*
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Milling, Thomas E., to Quaker Oats Company, The. Candy mixer. 3,778,032, Cl. 259-6.000.

Mills, Richard G.: *See—*
Lutes, Kenneth V.; Lander, James E.; Shanahan, Vincent J.; and Mills, Richard G., 3,777,678.

Milovancevic, Slavko. Electronically controlled watering. 3,777,976, Cl. 239-64.000.

Mimura, Hiroshi: *See—*
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Miner, Carroll R., to General Instrument Corporation. Compact TV tuner. 3,777,576, Cl. 74-10.290.

Minieri, Pasquale P., to Tenneco Chemicals, Inc. Preservatives for aqueous compositions which contain addition polymers. 3,778,400, Cl. 260-29.6mn.

Minneman, Lester C.: *See—*
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Mitchell, Paul T.; and Pagan, Peter A. Shaft lubricator operable at low speed. 3,777,851, Cl. 184-63.000.

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Miyala, Akira; Tomita, Chikayoshi; Suzuki, Akio; Okubo, Hideyo; and Magakuni, Masahiko, to Nippon Kokan Kabushiki Kaisha. Process for the electrolytic formation of aluminum coating on metallic surfaces in molten salt bath. 3,778,356, Cl. 204-29.000.

Miyaoka, Senri; and Morio, Minoru, to Sony Corporation. Convergence deflecting device for single-gun, plural-beam color picture tube. 3,778,666, Cl. 315-13.00c.

Mizoi, Yoshiaki: *See—*
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Mizuno, Hideaki; Konno, Toshio; and Akiyama, Naoki, to Victor Company of Japan, Limited. Method of forming a black patterned portion on a phosphor screen of a cathode-ray tube for color television sets. 3,778,266, Cl. 96-361.000.

Mizusawa, Mitutoyo; and Takeuchi, Hiroo, to Nisshin Kogyo Kabushiki Kaisha. Vacuum type servo device. 3,777,496, Cl. 60-593.000.

Mladek, Walter: *See—*
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Moen, Raymond S.; and Sanelli, Edward T., to Redmer Plastics, Inc. Plastic injection mold apparatus. 3,778,211, Cl. 425-245.000.

Mokros, Frank. Lawn conditioning machine. 3,777,460, Cl. 56-16.700.

Molby, Lloyd A., to Le Tourneau, R. G., Inc. Adjustable self-aligning pivot bearing, and ball pin and socket employing same. 3,778,174, Cl. 403-143.000.

Moller, Tilo; and Ketterer, Dieter, to Heckler & Koch GmbH. Firearm carrying handle and sight protector. 3,777,381, Cl. 42-1.00s.

Monarch Marking Systems Company, The: *See—*
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Montagne, Jean Bernard, to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie. Pneumatic tires. 3,777,799, Cl. 152-362.00r.

Montgomery, Donald B.: *See—*
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Mooney, James J., Jr.; and Polak, James C., to General Motors Corporation. Multi-range coaxial hydromechanical transmission. 3,777,593, Cl. 74-687.000.

Moore, Brian B., to International Business Machines Corporation. Operation request block usage. 3,778,780, Cl. 340-172.500.

Moore, Glen T. Phonograph record interlocking means. 3,778,068, Cl. 274-42.004.

Moore, Hugh K. Paint tube dispensing cap. 3,777,939, Cl. 222-189.000.

Moore, Peter N.; and Pierce, Leo F. Mud flap mounting means. 3,778,086, Cl. 280-154.50r.

Moore, Robert G., Jr., to Bendix Corporation, The. Method of and apparatus for control of helicopter gas turbine engine during auto-rotation. 3,777,478, Cl. 60-39.16r.

Moore, Thomas H.: *See—*
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Moran, Robert L. Automatic television programmer. 3,778,721, Cl. 325-396.000.

Morehouse, Edward Lewis, to Union Carbide Corporation. Lactone-silicone compositions. 3,778,458, Cl. 260-448.20b.

Morel, Rene, to Mefina S.A. Safety device for a gyratory rocket missile. 3,777,666, Cl. 102-80.000.

Mori, Kazuo: *See—*

Yamamoto, Hisao; Inaba, Shigeho; Hirohashi, Toshiyuki; Yamamoto, Michihiro; Ishizumi, Kikuo; Akatsu, Mitsuhiro; Maruyama, Isamu; Kume, Yoshiharu; Mori, Kazuo; and Izumi, Takahiro, 3,778,433.

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Morris, Paul S.; and Hutzler, Robert H., to Allied Chemical Corporation. Process for concentrating aqueous colloidal dispersions of polytetrafluorethylene. 3,778,391, Cl. 260-17.4st.

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Morrison, Robert, to Speedcraines Limited. Derrick cranes. 3,777,901, Cl. 212-58.000.

Morrison, Thomas E., to Continental Conveyor and Equipment Company. Self-aligning apparatus for idler roll assembly. 3,777,878, Cl. 198-202.000.

Morrisroe, John J.; and Banigan, Thomas F., to Pilot Chemical Company. Unsaturated alcohols and derivatives thereof. 3,778,479, Cl. 260-615.00b.

Morrisroe, John J.; and Banigan, Thomas F., to Pilot Chemical Company. 1,3,4 Triols and derivatives thereof. 3,778,482, Cl. 260-635.00r.

Mortland, Max M.; and Doner, Harvey E., to Michigan State University, The Board of Trustees of. Clay-arene complexes and process of producing same. 3,778,457, Cl. 260-430.000.

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Moyldew, Oraham Edward; and Shemack, John Lindsay, to Elevators Pty. Limited. Pattern generator for the control of motion of a body movable over a predetermined path. 3,777,855, Cl. 187-29.00r.

MTD Products Inc.: *See—*
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Mueller, Herbert; and Goetz, Norbert, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of α,β-unsaturated carbonyl compounds. 3,778,477, Cl. 260-599.000.

Mueller, Joseph F. Controlled cutting. 3,777,616, Cl. 90-13.200.

Muench, Paul W., to Borg-Warner Corporation. Oil return system for refrigeration apparatus. 3,777,509, Cl. 62-470.000.

Mukaiyama, Teruaki; Ueki, Massaaki; Maruyama, Hiroshi; Matsueda, Rei; and Gotow, Kuniaki. Process for the production of peptides. 3,778,428, Cl. 260-112.500.

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Munier, Ronald A.; and Ling, Charles Che, to Gamon-Calmet Industries, Inc., mesne. Magnetic converter for water meters. 3,777,565, Cl. 73-258.000.

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Murphy, John P., to Lubrizol Corporation, The. Lubricants and fuels containing nitrogen-bearing compositions. 3,778,372, Cl. 252-51.50a.

Murphy, Peter, to Girling Limited. Railway vehicle braking systems. 3,777,858, Cl. 188-181.00r.

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Myren, Darrell P. Body scrubbing articles. 3,778,172, Cl. 401-7.000.

Nagai, Tamiji, to Sony Corporation. Horizontal deflection circuit. 3,778,670, Cl. 315-27.0td.

Nagata, Shuji: *See—*
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Nagayama, Kazuo, to Seiken Kogyo Kabushiki Kaisha. Apparatus for automatically removing the covering from covered wire and winding the uncovered wire on a rod member. 3,777,352, Cl. 29-203.00d.

Nagel, Hans-Joachim: *See—*
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Nagy, Ernest J.; and Marsh, Ronald W., to Pullman Incorporated. Weather seal for railway car door. 3,777,424, Cl. 49-485.000.

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Nakamura, Yoshiro; Umehara, Akira; and Yanaba, Itsuyo, to Sankyo Kasei Company, Limited. Disposal of metal-containing waste water. 3,778,368, Cl. 210-54.000.

Nakayama, Yasuharu. Malcinization process. 3,778,418, Cl. 260-78.40d.

Nalick, Albert L. Adjustable shoe insert to reduce heel spur pain. 3,777,419, Cl. 36-71.000.

Namiki, Masayuki: *See—*
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Nedelec, Maruice; and Petitcollin, Jean-Marc, to Saint-Gobain Industries. Bending of flat glass on a mold with vacuum. 3,778,244, Cl. 65-106.000.

Nederlandse Organisatie voor Toegepast Natuurwetenschapplijk Orderzoek ten behoeve van de Volksgezondheid: *See—*
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Neely, James S., to Procter & Gamble Company, The. Compositions of matter containing heliotropyl nitrile as a flavoring agent and sweetener. 3,778,517, Cl. 426-175.000.
Nelson, Bernard J. Carriers attachable to automobiles and for use in carrying vehicles. 3,777,921, Cl. 214-450.000.
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Nicholas, Michael George; and MacPhain, Iain, to United Kingdom Atomic Energy Authority. Manufacturing composite articles. 3,778,261, Cl. 75-204.000.
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Nikowitz, Johann; and Schwarz, Michael, to Waagner-Biro Aktiengesellschaft. Device for transporting pourable goods. 3,777,938, Cl. 222-185.000.
Nilsson, Jan; and Brinkeborn, Bertram, to Allmanna Svenska Elektriska Aktiebolaget. Method of manufacturing rods or wire of compound material. 3,777,362, Cl. 29-474.300.
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Nistri, Raffaello, to Otlico Meccanica Italiana-OMI-S.p.A. Optical apparatus for collimation to infinity of two luminous images whose frequencies fall within different spectral bands. 3,778,548, Cl. 178-7.880.
Nittan Company, Limited: *See—*
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Nix, William H.: *See—*
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Nocella, William F., to Honeywell Inc. Switch resetting apparatus for multi-bank push button switches. 3,778,564, Cl. 200-5.00r.
Noe, Oskar, to BWG Bergwerk- und Walzwerk-Maschinenbau G.m.b.H., Firma. Method of and apparatus for extending and reducing thickness of a metallic band. 3,777,532, Cl. 72-205.000.
Noel y Compania Limitada Sociedad Anonima Argentina: *See—*
Abalo, Juan Manuel, 3,778,018.
Nofziger, Dale, to Ansonia Clock Company, Inc. Clock chime intensity control. 3,777,701, Cl. 116-149.000.
Nooi, Jacobus, to Heterochemical Corporation. Molecular complexes of a bis-(5-nitrofurfurylidene)-acetonequanylhydrazone compound and an amine. 3,778,435, Cl. 260-240.00a.
Nopanen, Esko J., to General Electric Company. Hair dryer. 3,777,406, Cl. 34-99.000.
Nordling, K. Fredrik; and Huey, Samuel T., to Digital Telephone Systems, Inc. Telephone subscriber line system intra call apparatus and method. 3,778,555, Cl. 179-18.0fc.
Nordson Corporation: *See—*
Rood, Alvin A.; Hogstrom, Edwin F.; and Stumphauzer, William C., 3,778,292.
Norfolk, David E. Belt and buckle assembly. 3,777,315, Cl. 2-321.000.
Norman, Leslie W.: *See—*
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Norman, Leslie W.; and Hunter, Skillman C., to Garrett Corporation, The. Method and apparatus for reaction propulsion. 3,777,487, Cl. 60-204.000.
Norman, McHenry, III. Apparatus for detecting and counting coincidence of incoming logic signals. 3,778,714, Cl. 324-181.000.
Norprint Limited: *See—*
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Norris Industries, Inc.: *See—*
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Novak, Frank A.; Schreiber, Kenneth T.; and Hydo, Steven J., to AR-DAC/USA, Incorporated. Secondary detection circuit with sharp cutoff for security validating. 3,778,628, Cl. 250-556.000.
Noyes, Leroy W., to General Motors Corporation. Connector contact including an isolation resistor. 3,778,752, Cl. 339-147.00r.
Nozawa, Takamitsu; and Kishi, Takao, to Yoshino Kogyosho Co., Ltd. Spraying device. 3,777,945, Cl. 222-394.000.
Nudelmont, Jean-Claude. Apparatus for indicating voltage presence phase sequence voltage magnitude ground faults, etc., in an electrical power distribution system. 3,778,801, Cl. 340-253.00r.
Nupp, Raymond W., to EDMAC Associates, Inc. Phase locked-FM detector. 3,778,728, Cl. 329-110.000.
Nurre, Thomas C., to International Paper Company. Bulk container reinforcements. 3,777,969, Cl. 229-37.00e.
Nutter, Gerald E., to Golf-In Equipment Corporation. Simulated golf game device. 3,778,064, Cl. 273-176.0fa.
N.V. Beakeart S.A.: *See—*
Morris, Edward O., 3,777,905.
N.V. Bekaert S.A.: *See—*
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Lewandowski, Raymond F.; and Markison, William C., 3,778,565.
Van Benschoten, Peter J.; and Kilsdonk, Jan Albert, 3,778,820.

Obhmke, Richard W.; and Opstead, Ronald F., to Minnesota Mining and Manufacturing Company. Enzyme-dispersible bandage. 3,777,759, Cl. 128-287.000.

Occhipinti, Carl; and Triner, Irvin Richard, to Bunker Ramo Corporation. Electrical connector. 3,778,753, Cl. 339-156.00r.

Ocean Recovery Systems, Inc.: *See—*
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Ochida, Hajime, to Matsushita Electric Industrial Co., Ltd. Electric pencil sharpener. 3,777,791, Cl. 144-28.720.

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Oertel, Harald; Roos, Ernst; and Ley, Kurt, to Bayer Aktiengesellschaft. Alpha, alpha-bis-(2-hydroxyphenyl)-diisopropyl benzenes as stabilisers for polyurethanes. 3,778,409, Cl. 260-45.80n.

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Okoshi, Takanori; and Migitaka, Masatoshi, to Hitachi, Ltd. Solid-state oscillator having such a structure that an oscillating element, a resonator and a radiator of electromagnetic waves are unified in one body. 3,778,717, Cl. 325-105.000.

Okubo, Hideyo: *See—*
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Olson, Floyd C., to Mayer, Oscar, & Co., Inc. Nutritional product of whey protein and collagen hydrolysate. 3,778,514, Cl. 426-61.000.

Olson, Rich: *See—*
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Ondetti, Miguel A.; Pluscec, Josip; Sheehan, John T.; Jorpes, Johan E.; and Mutt, Viktor, to Squibb, E. R., & Sons, Inc. Method of sulfating a tyrosine moiety. 3,778,429, Cl. 260-112.500.

Oohara, Saburo; Amemiya, Koitsuro; Nishijima, Yasushi; Fukushima, Mitsuyoshi; and Shimizu, Kunio, to Kanegafuchi Boseki Kabushiki Kaisha. Method of manufacturing artificial leather. 3,778,325, Cl. 156-278.000.

Oomen, Johannes A. F., to Cincinnati Electronics Corporation, mesne. Tuning method for T-network couplers. 3,778,731, Cl. 333-17.000.

Operations Analysis Inc.: *See—*
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Opstead, Ronald F.: *See—*
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Oreck, Richard A. Gunsight alignment apparatus. 3,777,404, Cl. 33-245.000.

Oregon Research Institute: *See—*
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Oshima, Akio: *See—*
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Ostrom, Charles T., to Federal-Moqul Corporation. Circuit board drill and method. 3,778,180, Cl. 408-226.000.

Ostwald, Heinz G.: *See—*
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Osui, Noriyuki: *See—*
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Otaki, Takashi, to Mitsubishi Jukogyo Kabushiki Kaisha. Defrosting method and apparatus. 3,777,505, Cl. 62-81.000.

Otis Engineering Corporation: *See—*
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Otlico Meccanica Italiana-OMI-S.p.A.: *See—*
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Ototani, Tohei; Shimodaira, Saburo; and Kataura, Yasuzi, to Research Institute for Iron, Steel and Other Metals of the Tohoku University, The. Corrosion resistant low carbon chromium alloy steel. 3,778,255, Cl. 75-126.00c.

Otsubo, Kizuki; and Ishikawa, Yoshikazu, to Nissan Motor Company Limited. Exhaust system for multi-rotor type rotary internal combustion engine. 3,777,719, Cl. 123-8.070.

Otto, Joachim F., to Anaconda Company, The. Rotary printer for numbering including Geneva wheel drive means. 3,777,660, Cl. 101-77.000.

Ouellette, Joseph H., to General Electric Company. Bucket cover attachment. 3,778,190, Cl. 416-196.000.

Outboard Marine Corporation: *See—*
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Owens, Thomas M. Sealed lighter. 3,778,219, Cl. 437-152.000.

Owens-Corning Fiberglas Corporation: *See—*
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Owens-Illinois, Inc.: *See—*
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Ozawa, Yasuriko, to Mitsubishi Denki Kabushiki Kaisha. Elevator floor selector. 3,777,854, Cl. 187-29.00r.

P&D Mfg. Co., Inc.: *See—*
Ruiten, Donald E.; and Davis, Richard A., 3,777,790.

Pacella, Gerald M.; and Eckman, Richard S. Dishwasher with cycle timing system. 3,777,989, Cl. 239-567.000.

Padgett, Freeman, 50% to Padgett, Ronnie Freeman. Pallet removing truck. 3,777,923, Cl. 214-506.000.

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Palmer, George W.: *See—*
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Panther Machine Corporation: *See—*
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Papannou, Plutarch Constantine, to Du Pont de Nemours, E. I., and Company. Fluorocarbon dry cleaning compositions. 3,778,379, Cl. 252-171.000.

Papay, Charles J.; and Settle, Ralph A., to United States Steel Corporation. Ultrasonic testing apparatus. 3,777,554, Cl. 73-71.50u.

Papierwerke "Waldhof-Aschaffenburg" AG: *See—*
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Paraho Corporation: *See—*
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Park, Davis & Company: *See—*
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Parker, Paul T.; and Mayer, Ivan, to Esso Research and Engineering Company. Alkylation with separate olefin streams including isobutylene. 3,778,489, Cl. 260-683.430.

Parkes, Jeffrey George Ernest, to Ford Motor Company. Rack and pinion steering gear. 3,777,590, Cl. 74-498.000.

Parmley, John W.: *See—*
Lindemann, Robert W.; and Parmley, John W., 3,778,620.

Parsons, Rodney, to Entryown Patents Ltd. Foldable articles. 3,777,674, Cl. 108-113.000.

Pasieka, John F.: *See—*
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Passavant, Francis C.: *See—*
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Patrick, Ralph E.: *See—*
Kovach, Stephen M.; and Patrick, Ralph E., 3,778,484.

Pattas, Konstantin, to Daimler-Benz Aktiengesellschaft. Thermal engine, especially piston engine. 3,777,718, Cl. 123-8.010.

Pauze, Denis R.: *See—*
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Pavlov, Viktor Grigorievich: *See—*
Sherman, Vladimir Efimovich; Dubonosov, Georgy Viktorovich; Portnov, Sergei Fedorovich; Fedotov, Jury Alexeevich; Grinberg, Yakov Zeemanovich; Soloviev, Nikodim Nikiforovich; Pavlov, Viktor Grigorievich; and Dmitriev, Efim Fedorovich, 3,777,534.

Pax, James H., to Brown, D. S., Company, The. Hexagonal hollow elastomer sealing strips. 3,778,176, Cl. 404-65.000.

Paxton, Wayne E., to General Motors Corporation. Spark plug pin gapping tool. 3,777,535, Cl. 72-293.000.

Pay, Donald Alexander, to Marconi Company Limited, The. Telecine equipment. 3,778,547, Cl. 178-7.880.

Payne, William H.: *See—*
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Peabody Galion Corporation: *See—*
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Pease, Richard R.; Blitzer, Frank; Giordano, Arthur A.; and Less, Frank L., to GTE Sylvania, Incorporated. Bipolar area correlator. 3,778,166, Cl. 356-71.000.

Peck, John C., to Wilputte Corporation. Furnace for combined incineration of rubbish, garbage, and sewage sludge. 3,777,680, Cl. 110-12.000.

Peddinghaus, Carl Ullrich. Machine for bending concrete-reinforcing bars. 3,777,525, Cl. 72-22.000.

Pedersen, Ernest T.: *See—*
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Pedrazzini, Andrea: *See—*
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Pemberton, Troy J.: *See—*
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Pennington, James Ronald; and Gardiner, Errol Murray, to Allied Chemical Corporation. Trona mining method. 3,778,108, Cl. 299-11.000.

Pepmeier, Carl R., to FMC Corporation. Sleeve making apparatus and method. 3,777,632, Cl. 93-94.000.

Perez, Jean: *See—*
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Perina, Joseph, to American Velcro, Inc. Attachment assembly. 3,777,435, Cl. 52-754.000.

Perlman, David, to North American Rockwell Corporation. Voltage controlled digital pulse train generator. 3,778,724, Cl. 328-150.000.

Perrott, Francis Cyril. Transportation means. 3,777,667, Cl. 104-88.000.

Persson, Sven-Eric Gote, to Telefonaktiebolaget L M Ericsson. Arrangement for alternation of two outputs in dependence on a change in the direction of a current appearing on an input. 3,778,641, Cl. 307-255.000.

Peterpaul, Joseph, to E.R.E. Laboratory, Inc. Automatic advance mechanism for microfiche reader. 3,778,141, Cl. 353-15.000.

Peterson Manufacturing Company: *See—*
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Peterson, Norman L.: *See—*
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Nedelec, Maruice; and Petitcollin, Jean-Marc, 3,778,244.

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Petrisko, Edwin M.; and Keller, Karl H.; deceased (by Keller, Penny C.; administrator), to United States of America, Navy. Cumulative fatigue life indicator. 3,777,555, Cl. 73-91.000.

Petro, James; and Rively, Clair M., to Westinghouse Electric Corporation. Beaded coils for electric lamps and similar devices. 3,778,664, Cl. 313-344.000.

Petro-Tex Chemical Corporation: *See—*
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Petrosky, Willard L.: *See—*
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Pfister, Hans; and Diepers, Heinrich, to Siemens Aktiengesellschaft. Method of producing a composite tubular superconductor. 3,777,368, Cl. 29-599.000.

Pfister, Rudolf: *See—*
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Pfizer Inc.: *See—*
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Pfleger, Frederick W. Tennis scoring device. 3,777,699, Cl. 116-120.000.

Pflugk, Hellmuth: *See—*
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Pfundstein, Werner K.: *See—*
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Philipps, Louis E.; and Stanis, Eugene A., to Medelco, Incorporated. Recorder control system. 3,778,774, Cl. 340-172.500.

Phillips, David L., to Strong-Scott Mfg. Co., The. Dryer. 3,777,810, Cl. 165-92.000.

Phillips, Graham Chesterton: *See—*
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Phillips Petroleum Company: *See—*
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Picardat, Robert. Lawn treating machine. 3,777,991, Cl. 239-656.000.

Pierce, Leo F.: *See—*
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Pierson, Merlin A., mesne: *See—*
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Pilkington Brothers Limited: *See—*
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Morrisroe, John J.; and Banigan, Thomas F., 3,778,482.

Pines, Seemon H., to Merck & Co., Inc. Isocyanates and carbamates of penicillins and 3-cephem-4-carboxylic acids. 3,778,432, Cl. 260-243.00c.

Pinnow, Douglas Arthur; Van Uitert, Legrand Gerard; and Williams, John Charles, to Bell Telephone Laboratories, Incorporated. Optical transmission line. 3,778,132, Cl. 350-96.0wg.

Pinnow, Kenneth E.; Mehta, Jayendra M.; and Moskowitz, Arthur, to Crucible Steel Corporation. Method for producing stainless steel. 3,778,316, Cl. 148-12.000.

Piper, Robert J., to Stearns Manufacturing Co. Inc. Conveyor assembly. 3,777,877, Cl. 198-189.000.

Piquerez, Ervin, S. A.: *See—*
Piquerez, Pierre-Michel, 3,777,474.

Piquerez, Pierre-Michel, to Piquerez, Ervin, S. A. Fluid-tight control mechanism, for example for watches. 3,777,474, Cl. 58-90.00b.

Piret, Jean, to Automobile Peugeot and Regie Nationale des Usines Renault. Automatic transmission casing unit for an automobile vehicle. 3,777,849, Cl. 184-6.120.

Pittsburgh Corning Corporation: *See—*
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Pittsburgh-des Moines Steel Company: *See—*
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Plachy, William. Medicated disposable pad. 3,777,754, Cl. 128-268.000.

Plamper, Gunter F., to MTD Products Inc. Variable speed drive having speed limiting means. 3,777,585, Cl. 74-230.17d.

Platt International Limited: *See—*
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Platt, Steven; Pomeranz, Jehoshua N.; and Tewarson, Dinesh K., to International Business Machines Corporation. Signal voltage level translating circuit. 3,778,640, Cl. 307-254.000.

Plempel, Manfred: *See—*
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Plonsker, Larry: *See—*
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Plowman, James S.; and Fowkes, Ivar G., to United Aircraft Corporation. Composite strut joint construction. 3,778,185, Cl. 415-217.000.

Plumer, Roy D.: *See—*
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Plummer, Charles H.; and Skistimas, Donald V., to Johnson & Johnson. Nonwoven textile fabrics and method of making the same. 3,778,341, Cl. 162-125.000.
Plunkett, Bradley J.: *See—*
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Poenisch, Richard Bruce; and Birch, Fernando Francis, to Oxirane Corporation. Hydroperoxide treatment. 3,778,382, Cl. 252-326.000.
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Raitto, Russell G., to Concord Laboratories, Inc. Method and apparatus for collecting urine. 3,777,739, Cl. 128-2.00f.
Rakoczy, Dohdan, to Du Pont de Nemours, E. I., and Company. Photographic gelatino-silver halide emulsions containing hydrolyzed modified gelatin, and a process for their manufacture. 3,778,278, Cl. 96-114.800.
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Recasens, Joseph; Blanchet, Pierre; and Duchenoy, Jacques, to L'Electro-Refractaire. Refractory members for use in terminal regenerators or recuperators. 3,777,805, Cl. 165-9.100.

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Reedyk, Cornelius Wilfred, to Bell Canada-Northern Electric Research Limited. Electret microphone. 3,778,561, Cl. 179-111.00e.

Reehil, Edward G.; and Buddendeck, Gerald A., to Xerox Corporation. Electrostatic reproduction machine having selectable magnification ratios. 3,778,147, Cl. 355-8.000.

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Reiche, Alfons, to Gessner, Peter. Process and apparatus for assisting in starting internal combustion engines. 3,777,728, Cl. 123-122.00d.

Reichenbacher, Frank W.; Kraver, Theodore C.; and Hope, Edward F., to Burn Treatment Skin Bank, Inc. Process for producing split-thickness animal skin for protecting flayed human tissue. 3,777,599, Cl. 83-39.000.

Reid, Middleton & Associates, Inc.: *See—*
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Reimann, William George. Flatpack lead positioning device. 3,778,530, Cl. 174-68.500.

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Reinhart, Richard D.; and Straughn, Robert O., to General Mills, Inc. Process for extruding tubular, corrugated products. 3,778,520, Cl. 426-446.000.

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Republic Corporation; d/b/a Glas-Craft of California, a division of Republic Corporation: *See—*
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Rhinehart, Vance, to Cumberland Corporation. Automated systems for raising and transporting broilers. 3,777,710, Cl. 119-17.000.

Rhodes, Russell R., to Honeywell Information Systems, Inc. Station interface unit for process control of a direct digital control and/or supervisory control system. 3,778,772, Cl. 340-163.000.

Richardson, Walter: *See—*
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Richman, Peter L. Electrical measuring systems using a quarter-square multiplier. 3,778,608, Cl. 235-194.000.

Richter, Friedrich, to Hell, Rudolf, Dr. Ing., GmbH. Apparatus for the electro-mechanical production of printing matrices on variable scale of reproduction. 3,778,544, Cl. 178-6.60b.

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Ridge, Alvin Arthur; and Polchet, Jack Marquis, to South African Coal, Oil and Gas Corporation Limited. Methods for preparing master batches of additive concentrates. 3,778,288, Cl. 106-308.00q.

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Ririe, Max H.; Roland, Murray C.; and Olson, Rich, to Lockwood Corporation. Mobile irrigation system and pipe coupling. 3,777,979, Cl. 239-177.000.

Risgin, Ojars; and Szeles, Donald M., to Sensors, Inc. D.C. electronic apparatus for IR radiation temperature measurement. 3,777,568, Cl. 73-355.0em.

Ritchey, Harold W., to Thiokol Chemical Corporation. Firearm and cartridge therefor. 3,777,387, Cl. 42-84.000.

Ritchie, John K. Dental silver retrieval apparatus. 3,777,403, Cl. 32-33.000.

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Rivas, Dayton F. Dual replaceable holesaw bit. 3,778,179, Cl. 408-206.000.

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Riza, Warren D. Motor driven golf cart. 3,777,836, Cl. 180-260.000.

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Roberts, Harold Devere. Denture support frame with ramus implant for molar area of lower jaw. 3,777,402, Cl. 32-10.00a.

Robertson, Gordon Ian, to Western Electric Company, Incorporated. Mechanical scan system for ion implantation. 3,778,626, Cl. 250-492.000.

Robertson, H. H., Company: *See—*
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Robinson, John Wesley, to Telattach, Inc. Interactive display and viewer response apparatus and method. 3,777,410, Cl. 35-9.00b.

Rockel, Lee A. Punch unit. 3,777,399, Cl. 30-361.000.

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Roerty, Dennis F.; and MacIndoe, Robert C., to Westinghouse Electric Corporation. Linear scale measuring instrument having preassembled coil support frame. 3,778,712, Cl. 324-151.000.

Roger, Joseph, to Thomson-CSF. Radar system for detecting low-flying objects. 3,778,824, Cl. 343-7.00a.

Rogers, Arthur L., to Johnson Stamping and Fine-Blanking Company. Snowmobile wheel support combination. 3,777,829, Cl. 180-5.00r.

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Rollins, Garland N., to United States of America, National Aeronautics and Space Administration. System for calibrating pressure transducer. 3,777,546, Cl. 73-4.00r.

Romano, Aldo, to Ates Componenti Elettronici S.p.A. Integrated voltage stabilizer with negative internal resistance. 3,778,698, Cl. 323-4.000.

Rood, Alvin A.; Hogstrom, Edwin F.; and Stumphauzer, William C., to Nordson Corporation. Method of striping the inside seams of cans. 3,778,292, Cl. 117-43.000.

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Rosano, Henri L.; and Gerbacia, William E., to Allied Chemical Corporation. Fluorocarbon microemulsions. 3,778,381, Cl. 252-311.000.

Rose, Harry J. Archery bow and quiver. 3,777,734, Cl. 124-24.00a.

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Rosov, Robert J., to Oregon Research Institute. Automatic bacterial specimen streaker. 3,778,351, Cl. 195-127.000.

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Roth, Miles I., to Marlin Firearms Co., The. Apparatus for and method of registering firearm serial numbers. 3,778,781, Cl. 340-172.500.

Roth, Shirley H., to Cities Service Company. Process for protecting a substrate with an arylsulfonamidopyridine intumescent agent. 3,778,303, Cl. 117-136.000.

Rothacker, Francis N.; and Bujese, David P., to Copy Research Corporation. Electrostatic copying machine. 3,778,690, Cl. 317-262.00a.

Rouchy, Maurice Georges. Sodium tetracycline-methylene-sulfomethoxy pyridazine propane-sulfonate as an antibacterial agent. 3,778,503, Cl. 424-227.000.

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Ruger, William B.; and Larson, Lawrence L., to Sturm, Ruger & Co., Inc. Mechanism for single action firearm. 3,777,384, Cl. 42-66.000.

Ruiten, Donald E.; and Davis, Richard A., to P&D Mfg. Co., Inc. Silage guide. 3,777,790, Cl. 141-392.000.

Runge, Richard J., to Chevron Research Company. Method of ultra long spaced electric logging of a well bore to detect horizontally disposed geologically anomalous bodies in the vicinity of massive vertically disposed geologically anomalous bodies lateral t and not intercepted by the well bore. 3,778,701, Cl. 324-10.000.

Rupp, Bruce A.: *See—*
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Rybap, Vaclav: *See—*
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Ryburn, Kenneth D.; McClone, Robert J.; and Fox, Charles H., to Westinghouse Air Brake Company. Pneumatic brake system. 3,778,115, Cl. 303-3.000.

S. & S. Industries, Inc.: *See—*
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SA Francois Salomon & Fils: *See—*
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Saab-Scania Aktiebolag: *See—*
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Sabin, Raymond H.: *See—*
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Safety Research and Development Inc.: *See—*
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Sagusa, Hisayuki: *See—*
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Sahara, Masayoshi: *See—*
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Saint-Gobain Industries: *See—*
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Saint-Martin, Liliane, to Societe Civile de Recherches et d'Etudes Therapeutiques. Lithium salt based pharmaceutical composition and methods of use. 3,778,505, Cl. 424-317.000.

Saito, Eisuro, to Sony Corporation. Printer. 3,778,842, Cl. 346-136.000.

Saitoh, Torahiko: *See—*
Iizuka, Toru; Ionooka, Katsuo; Saitoh, Torahiko; and Yasuda, Isao, 3,778,590.

Saivisalmi, Risio: *See—*
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Sakai, Shozi: *See—*
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Sakai, Takeyo: *See—*
Matsuda, Kazuo; Tanaka, Yoshiaki; and Sakai, Takeyo, 3,778,480.

Sakamoto, Yoichi, to Matsushita Electric Industrial Co., Ltd. Channel selection system. 3,778,736, Cl. 334-15.000.

Sakata, Minchiro: *See—*
Kobayashi, Akira; Sugano, Tadashi; Koike, Toshio; and Sakata, Minehiro, 3,778,622.

Sakurai, Hiroshi: *See—*
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Salco, Inc.: *See—*
Thompson, Ralph F., 3,777,988.

Sallman, Alfred; and Pfister, Rudolf. Chemical intermediates for the production of substituted-anilinophenylacetic acids and esters. 3,778,470, Cl. 260-518.00r.

Salomon, Georges Pierre Joseph, to SA Francois Salomon & Fils. Security bindings for skis. 3,778,072, Cl. 280-11.35n.

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Samalon, Eugene J.; Lamb, Gilbert C., Jr.; and Lentz, Ervin C., to Tenneco Inc. Automatic oil level regulator. 3,777,852, Cl. 184-103.00r.

Samuel, Thevor, to Sangamo Electric Company. Damping clutch for indicating meter. 3,778,711, Cl. 324-125.000.

Samuelsson, Mokjas Erik Samuel; Samuelsson, Mokjas Jonas; and Degerman, Karl Johan Olov, to Saab-Scania Aktiebolag. Vehicle frame and body straightening devices. 3,777,537, Cl. 72-404.000.

Samuelsson, Mokjas Jonas: *See*—
Samuelsson, Mokjas Erik Samuel; Samuelsson, Mokjas Jonas; and Degerman, Karl Johan Olov, 3,777,537.

San Saba Development Association: *See*—
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Sanderson, Frank T.: *See*—
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Sankyo Kasei Company, Limited: *See*—
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Sanner, Axel: *See*—
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Sant'Anselmo, Robert. Reinforcing patch. 3,777,378, Cl. 40-27.000.

Sanz, Manuel C.: *See*—
Prost, Jean-Louis; and Sanz, Manuel C., 3,778,790.

Sarbacher, Robert I., to Boque, John C. Emergency starting power for engines. 3,778,632, Cl. 290-50.000.

Sargent, Walter W. Convertible horseshoe pit. 3,778,061, Cl. 273-104.000.

Sartori, Rolland, to Ateliers de Constructions. Yarn guide reciprocating apparatus. 3,777,581, Cl. 74-110.000.

Sasaki, Ryoichi; Hataya, Humio; Fukui, Yutake; and Kashimura, Tetsuo, to Hitachi, Ltd. Heat-resistant alloy for a combustion liner of a gas turbine. 3,778,256, Cl. 75-134.00f.

Sasse, Frederick H.: *See*—
Kubli, Robert A.; Sasse, Frederick H.; Uttrachi, Gerald D.; Van Dyke, Le Roy L.; and Nakabayashi, Masahiro, 3,778,587.

Sato, Hisatake: *See*—
Hayashi, Hideo; Sato, Hisatake; and Oshima, Akio, 3,778,421.

Sato, Kazuo; Hisatsune, Tomio; and Izawa, Minoru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Vehicle safety device. 3,778,823, Cl. 343-7.0e.

Sato, Masamichi; Takimoto, Masaaki; Takahashi, Isoji; and Komaki, Takao, to Fuji Photo Film Co., Ltd. Charging method of electrophotographic materials. 3,778,623, Cl. 250-325.000.

Satoo, Yuukoo: *See*—
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Saveliev, Vyacheslav Ivanovich: *See*—
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Savornin, Jacques, to Commissariat a l'Energie Atomique. Protective clothing unit for conducting work in a deleterious atmosphere. 3,777,750, Cl. 128-147.500.

Sawada, Hiraki, to Nissan Motor Company, Limited. Rotary internal combustion engine of the trochoidal type. 3,777,721, Cl. 123-8.450.

Scania Dental AB: *See*—
Lohr, Torbjorn, 3,777,756.

Scanlan, John J., to Remington Arms Company, Inc. Obturator for firearm adapted to fire caseless or expendable ammunition. 3,777,614, Cl. 89-26.000.

Schade, John Alan; and Levy, Hans, to A.C. Manufacturing Company. Humidifier for environmental control system. 3,778,042, Cl. 261-105.000.

Schaefer, Daniel F., to Rockwell International Corporation. Zero degree phase comparator. 3,778,723, Cl. 328-133.000.

Schaefer, Langdon C.; and Thomas, Roland C., to Emerson Electric Company. Air breather fitting for reservoirs. 3,777,848, Cl. 184-1.00c.

Schapf, Walter G. Static-charge resistant synthetic yarns. 3,778,331, Cl. 161-67.000.

Scharp, Gerson, to Computer Sciences Corporation. Bearing detection system. 3,778,835, Cl. 343-113.000.

Schegolevatykh, Vadim Dmitrievich: *See*—
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Scherber, Werner. Method of manufacturing a field effect transistor. 3,777,363, Cl. 29-571.000.

Schering AG: *See*—
Dahms, Wolfgang; and Todt, Hans-Gunther, 3,778,357.

Schering Corporation: *See*—
Herbine, Richard H.; and Morrison, David J., 3,777,447.

Schibler, Luzius; and Harris, Melvin, to Ciba-Geigy AG. Process for the encapsulation of substances which are finely distributed in a liquid, and capsule compositions produced thereby. 3,778,383, Cl. 252-316.000.

Schiefer, Richard B.: *See*—
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Schieser, Warren J.; and Vickers, Stanley E., to Corco, Inc. Machine for removal of bottles from shipper bags and placement thereof on a conveyor. 3,777,913, Cl. 214-8.50d.

Schieving, Dick: *See*—
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Schiff, Norman: *See*—
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Schiller, Jacob D.; Cheslik, Scott L.; and Gonzales, J. Tim, to Mallory, P. R., & Co., Inc. Material working machine. 3,778,582, Cl. 219-87.000.

Schinella, Richard D.; and Herndon, William H., to Fairchild Camera and Instrument Corporation. Methods for forming metal/metal silicide semiconductor device interconnect system. 3,777,364, Cl. 29-578.000.

Schlegel, Richard: *See*—
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Schloemann Aktiengesellschaft: *See*—
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Schmedes, Helga; Hansen, Paul; and Welz, Bernhard, to Bodenseewerk Perkin-Elmer & Co., G.m.b.H. Heated sample cell. 3,778,156, Cl. 356-244.000.

Schmidt, Felix Helmut: *See*—
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Schmidt, John, Jr., to Littelfuse, Inc. In-line fuse holder assembly. 3,778,741, Cl. 337-201.000.

Schmidt, William G.; Gabbard, Ova G.; Hosted, John M.; and Maillet, Wilfrid G., to Communications Satellite Corporation. TDMA satellite communications system with rapid automatic re-entry following brief outages of earth station equipment. 3,778,715, Cl. 35-2.000.

Schmitt, Jerry C., to King Radio Corporation. Area navigation computer and solid state filter. 3,778,602, Cl. 235-150.260.

Schmitt, Joseph W.; and Starkey, Donald L., to Sanders Associates, Inc. Continuously updating fourier coefficients every sampling interval. 3,778,606, Cl. 235-156.000.

Schneider, Felix, to Rheinstahl AG. Railway car suspension. 3,777,672, Cl. 105-453.000.

Schneider, Jos., & Co., Optische Werke: *See*—
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Schoenman, Leonard: *See*—
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Scholten, Johannes Hermanus Maria, to U.S. Philips Corporation. Keyboard with roll-over feature. 3,778,818, Cl. 340-365.00e.

Schott, Herbert: *See*—
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Schreier, Josef; and Klimeck, Hugo, to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H. Scraper flight conveyor. 3,777,876, Cl. 198-171.000.

Schroder, Jurgen; Ochel, Gunter; and Von Horsten, Hans-Joachim, to U.S. Philips Corporation. Transmission arrangement. 3,778,549, Cl. 178-68.000.

Schroter, Herbert: *See*—
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Schubart, Rudiger; Eholzer, Ulrich; Kempermann, Theo; and Roos, Ernst, to Bayer Aktiengesellschaft. Vulcanization process with S,S'-carbonyl-bis-dialkydithio-phosphate. 3,778,419, Cl. 260-79.50b.

Schulte-Elte, Karl-Heinrich: *See*—
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Schultheiss, Paul C., to Stanley Works, The. In-header hydraulic operator. 3,777,620, Cl. 91-394.000.

Schurenberg, Rudi; and Wenzel, Heinz-Eckard, to Torkret GmbH. Pump construction. 3,777,626, Cl. 92-137.000.

Schuster, Gregor: *See*—
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Schwaller, Bernard L. Compressor valve assembly. 3,777,779, Cl. 137-512.300.

Schwartz, Herbert L., to S. & S. Industries, Inc. Angled breast supporting frames. 3,777,763, Cl. 128-476.000.

Schwartz, Louis E. Tape cassette holder. 3,777,881, Cl. 206-1.00r.

Schwartz, Robert; and Goldberg, Morris. Cephalometric device. 3,778,625, Cl. 250-444.000.

Schwarz, Michael: *See*—
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Schwarzkoff, August, to Windmoller & Holscher. Handle-type carrying bag made of plastics material sheeting. 3,777,970, Cl. 229-54.00r.

Schweizerische Industrie-Gesellschaft: *See—*
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Schwenker, David G.: *See—*
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Scigliano, Josef, to Gabor, Eva, International, Ltd. Wefted hair structure and method of construction. 3,777,768, Cl. 132-53.000.

Sciola, Joseph; and Nagy, Gabor, to Super Chuck Company, Inc. Safety drive chuck. 3,777,999, Cl. 242-68.400.

SCM (Canada) Ltd.: *See—*
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SCM Corporation: *See—*
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Scott, Harold C. Alternating current machine armature. 3,778,653, Cl. 310-144.000.

Scott, O. M., & Sons Company, The: *See—*
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Scott Paper Company: *See—*
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Searle, John Gilbert; and Hunt, David John, to Allwood, Searle & Timney Limited. Friction welding apparatus. 3,777,967, Cl. 228-2.000.

Sease, John D.; and Harrington, Francis E., to United States of America, Atomic Energy Commission. Nuclear fuel element with axially aligned fuel pellets and fuel microspheres therein. 3,778,348, Cl. 176-67.000.

Seaton-Wilson, Incorporated: *See—*
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Security Technology Corporation: *See—*
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Seib, Kenneth L.: *See—*
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Seider, Myron A.: *See—*
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Seiken Kogyo Kabushiki Kaisha: *See—*
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Selden, Robert W.; and Schein, Edward W., to Weyerhaeuser Company. Connector. 3,777,434, Cl. 52-753.000.

Selenke, Albert A. Adjustable support. 3,778,013, Cl. 248-221.000.

Selin, Terry G.: *See—*
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Seney, John Seymour, to Du Pont de Nemours, E. I., and Company. Apparatus for monitoring and controlling tension in an advancing flexible elongate material. 3,777,959, Cl. 226-25.000.

Sensors, Inc.: *See—*
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Sentinel Bag and Paper Co., Inc.: *See—*
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Serres, Carl, Jr.; and Bolton, Benjamin A., to Standard Oil Company. Polyamide-imide composition containing p-toluene sulfonic acid as stripping agent. 3,778,417, Cl. 260-978.9tf.

Settle, Ralph A.: *See—*
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Seventrees, Ltd.: *See—*
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Theodore, Paris, 3,777,954.

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Shah, Ashok C.: *See—*
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Shahbender, Rabah A., to RCA Corporation. Method of making a magnetic recording head. 3,777,369, Cl. 29-603.000.

Shanahan, Vincent J.: *See—*
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Shapiro, Stanley; Tyler, Derek E.; and Pryor, Michael J., to Olin Corporation. Plated copper base alloy article. 3,778,237, Cl. 29-199.000.

Shappe, James F., to Acme Highway Products Corporation. Strip inserting apparatus. 3,777,353, Cl. 29-235.000.

Sharp, David E.: *See—*
Sharp, James G.; and Sharp, David E., 3,777,462.

Sharp, James G.; and Sharp, David E. Fruit harvester. 3,777,462, Cl. 56-328.000.

Sharp, Richard A.; Gille, John P.; and McGrew, Jay L., to Martin Marietta Corporation. Capillary insulation. 3,777,501, Cl. 62-45.000.

Shaver, William R.: *See—*
Miller, Roy W.; Stark, Marvin; and Shaver, William R., 3,777,671.

Shaw, Elliott N., to Polaroid Corporation. Photographic element comprising a gelatin aqueous composition containing a halomethyl ketone of benzyloxycarbonylphenylalanine. 3,778,276, Cl. 96-94.00r.

Shaw, Milton C. Segmented griding wheel. 3,777,443, Cl. 51-206.500.

Shaw, Richard Dudley. Compacting refractory particles having a surface coating of gelled silica. 3,778,493, Cl. 264-63.000.

Shearing, Herbert Jackson, to Imperial Chemical Industries Limited. Decorative flooring surfaces. 3,778,290, Cl. 117-8.000.

Sheehan, John T.: *See—*
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Shell Oil Company: *See—*
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Shendure, Ashok S., to Crawford Fitting Company. Double ended shut off coupling. 3,777,782, Cl. 137-614.020.

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Sheridan, David S. Post operative drainage tubes with suture strip and method of use. 3,777,761, Cl. 128-350.00r.

Sherman, Vladimir Efimovich; Dubonosov, Georgy Viktorovich; Portnov, Sergei Fedorovich; Fedotov, Jury Alexeevich; Grinberg, Yakov Zeemanovich; Soloviev, Nikodim Nikiforovich; Pavlov, Viktor Grigorievich; and Dmitriev, Efim Fedorovich. Working stand of multstrand roller cold-tube and pipe rolling mill. 3,777,534, Cl. 72-208.000.

Sherwood, Kenneth C., to Kae-Tee Development Corporation. Game apparatus. 3,778,062, Cl. 273-121.00a.

Shibata, Haruo: *See—*
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Shichijo, Yuzo; Asano, Gyoichi; and Takama, Eizo. Process for producing ferrites. 3,778,374, Cl. 252-62.620.

Shiga, Akio; and Ishida, Kengo, to Kyowa Hakko Kogyo Co. Ltd. Process for preparing meat extract-like seasoning. 3,778,513, Cl. 426-7.000.

Shimabara, Tatsutoshi: *See—*
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Shimizu, Monetaka, to Kabushiki Kaisha Koparu. Electronic shutter for photographic camera. 3,777,646, Cl. 95-53.0eb.

Shimizu, Sakae: *See—*
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Shimodaira, Saburo: *See—*
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Shindel, Gustave A.: *See—*
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Shinko Electric Co., Ltd.: *See—*
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Shiraishi, Minoru: *See—*
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Shlosinger, Arnold P., to TRW Inc. Heat pipe with dual working fluids. 3,777,811, Cl. 165-105.000.

Shore, John D.: *See—*
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Shorrock, Shanley. Process for making tufted carpet. 3,778,330, Cl. 161-67.000.

Shove, Gordon William: *See—*
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Shuman, Joseph G. Enuresis bed pad. 3,778,570, Cl. 200-61.050.

Shutes, Emmett B.: *See—*

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Shwayder, Warren M.: *See—*
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Shwayder, Warren M.; and Sear, Baruch, to Shwayder, Warren M. Saw and impact resistant lock shackle. 3,777,517, Cl. 70-53.000.
Siebol, George; and Rippy, Dorian F. Hydraulic-operated lockbolt fastener setting tool. 3,777,540, Cl. 72-391.000.
Siemag Siegener Maschinenbau GmbH: *See—*
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Silver, Gary L.: *See—*
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Silverberg, Norton, to Xerox Corporation. Output keyboard apparatus and signal translating methods therefor. 3,778,817, Cl. 340-365.00c.
Silverstone, Calvin Eric, to British Leyland Truck and Bus Division Limited. Method of making regenerative heat-exchanger seals. 3,778,293, Cl. 117-93.1pf.
Silverstrom, David: *See—*
Blazey, Lawrence; Silverstrom, David; and Rocker, Elmer, 3,777,673.
Simjian, Luther G. Exercise and massaging apparatus. 3,777,745, Cl. 128-57.000.
Simon Engineering Dudley Limited: *See—*
Ashworth, Denis Henry, 3,777,845.
Simon-Hartley Limited: *See—*
Hartley, Michael Augustine; and Rowley, Robert, 3,777,890.
Simonetti, Sergio, to Warner-Lambert Company. Cartridges having tandemly mounted cutting edges on two sides thereof. 3,777,396, Cl. 30-32.000.
Simpson, Henry George: *See—*
Cude, Arthur Leslie; and Simpson, Henry George, 3,777,821.
Simpson, James H., Jr.: *See—*
Bayley, Donald S.; Greenwood, Ivan A., Jr.; and Simpson, James H., Jr., 3,778,700.
Simpson, William R. J., to Sandoz-Wander Inc. 4-Amino-isoxazolo(5,4-d)pyrimidines and nitrates thereof. 3,778,438, Cl. 260-256.40f.
Simpson, William R. J., to Sandoz-Wander, Inc. 1-Substituted amino-isoquinolines and nitrates thereof. 3,778,440, Cl. 260-288.00r.
Sindermann, Siegmar, to Holstein & Kappert Maschinenfabrik Phonix GmbH. Method and apparatus for applying closures to containers. 3,777,449, Cl. 53-43.000.
Singer Company, The: *See—*
Fromknecht, Charles Thomas; and Davis, John C., 3,778,577.
Hage, Joseph C., 3,777,686.
Hendler, Harvey S.; Albert, William C.; and Evans, John, 3,778,123.
Ragen, Robert A., 3,778,778.
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Singer-General Precision, Inc.: *See—*
Bayley, Donald S.; Greenwood, Ivan A., Jr.; and Simpson, James H., Jr., 3,778,700.
Sirantoine, Albert, to CEFILAC. Method of hot piercing metal billets. 3,777,528, Cl. 72-41.000.
Sirota, Julius: *See—*
Fazioli, Chris T.; Sirota, Julius; and Weidener, Richard A., 3,778,399.
Sjoberg, Berndt Olof Harald: *See—*
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Enander, Per Henry, 3,778,031.
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Sloan Valve Company: *See—*
Billester, Henry R., 3,778,023.
Slough, Ronald S.; and Jones, Robert D., to Fairfield Engineering and Manufacruting Co. Apparatus for liquid composing. 3,778,233, Cl. 23-259.100.
Smearing, Robert W., to General Electric Company. Electrical insulation. 3,778,536, Cl. 174-121.0sr.
Smith, Jay, III; Schmidt, Gerald W.; and Jones, Lawrence T., to California R & D Center. Musical jump rope. 3,778,053, Cl. 272-75.000.
Smith, Leward N. Suction dredge with brush cutting attachment. 3,777,375, Cl. 37-67.000.
Smith, Mary Kay Hrncir: *See—*
Feuberbacher, David George; and Smith, Mary Kay Hrncir, 3,777,818.
Feuerbacher, David George; and Smith, Mary Kay Hrncir, 3,777,817.
Smith, Paul K.; Huntoon, Richard T.; and Mosley, Wilbur C., Jr., to United States of America, Atomic Energy Commission. Chemical plating method of preparing radiation source material. 3,778,295, Cl. 117-100.00b.
Smith, Richard A.; and Harris, Elmer E., to Heinz, H. J., Company. Apparatus for inspecting bodies for the presence of hard particles. 3,777,886, Cl. 209-109.000.
Smith, Stuart Allen, to Illinois Tool Works, Inc. Container carrier and package. 3,778,096, Cl. 294-87.200.
Smith, Thomas C.: *See—*
Queener, Carl A.; Ralston, William C.; Smith, Thomas C.; and Welsh, Joseph P., 3,778,262.
Smith, W. C., & Sons, Inc.: *See—*
Carroll, Lee, 3,777,807.
Smithmeyer, Louis P. C. Static balancer for automotive and other similar wheels. 3,777,575, Cl. 73-483.000.
Smollin, Henry A.: *See—*
Castrovillo, Salvatore J.; and Smollin, Henry A., 3,778,833.
Smyers, William H., Jr.; and Russo, Ronald D., to New Britain Machine Company, The. Resilient quick release for socket wrench. 3,777,596, Cl. 81-177.00g.
Snoeks, Jan: *See—*
Spaargaren, Klaas; and Snoeks, Jan, 3,778,725.
Snook, Richard K., to Diginetics Incorporated. Ranging amplifier systems. 3,778,710, Cl. 324-123.00r.
Snyder, Robbie L.; Spencer, Ambrose; and Butts, Harlan, to Fixtures Mfg. Corporation. Table and chair structure and means for pivotally mounting chairs. 3,778,102, Cl. 297-170.000.
Sobran, Michael J., to Glass Containers Corporation, mesne. Support means for releasably suspending container. 3,777,875, Cl. 198-131.000.
Societa Italiana Resine S.p.A.: *See—*
Funaioli, Ettore; Landini, Piercarlo; and Marella, Giulio, 3,777,995.
Societe Anonyme Automobiles Citroen: *See—*
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Societe anonyme des Etablissements: *See—*
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Societe anonyme dite: L'Oreal: *See—*
Aubin, Guy; and Manoussos, Georges, 3,778,502.
Societe anonyme dite: ORSYMONDE: *See—*
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Societe Civile de Recherches et d'Etudes Therapeutiques: *See—*
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Societe d'Applications Generales d'Electricite et de Mecanique SAGEM: *See—*
Claret, Rene; and Picard, Jean Francois, 3,778,167.
Societe de Traitements Electrolytiques et Electrothermiques: *See—*
Doucerain, Jacques; and Baumann, Bernard, 3,778,017.
Societe d'Exploitation des Brevets Neiman: *See—*
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Societe Francaise des Tubes Pneumatiques: *See—*
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Societe Generale de Constructions Electriques et Mecaniques (Alsthom): *See—*
Lehuen, Christian; and Gillet, Roger, 3,778,649.
Societe Rhodiaceta: *See—*
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Soderlund, Alfred. Wave energy motors. 3,777,494, Cl. 60-507.000.
Solid State Devices, Inc.: *See—*
Jarko, Michael F.; Powers, Avery W.; and Newmeyer, Reed A., 3,778,762.
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Sherman, Vladimir Efimovich; Dubonosov, Georgy Viktorovich; Portnov, Sergei Fedorovich; Fedotov, Jury Alexeevich; Grinberg, Yakov Zeemanovich; Soloviev, Nikodim Nikiforovich; Pavlov, Viktor Grigorievich; and Dmitriev, Efim Fedorovich, 3,777,534.
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South African Coal, Oil and Gas Corporation Limited: *See—*
Ridge, Alvin Arthur; and Polchet, Jack Marquis, 3,778,288.
S.p.A. Virginio Rimoldi & C.: *See—*
Marforio, Nerino, 3,777,850.
Spaargaren, Klaas; and Snoeks, Jan, to Shell Oil Company. Non-drifting hold-amplifier. 3,778,725, Cl. 328-151.000.
Spalding, James A.: *See—*
Spalding, Robert H.; and Spalding, James A., 3,777,943.
Spalding, Robert H.; and Spalding, James A., to Diemakers, Inc. Gooseneck valve arrangement for diecasting machine. 3,777,943, Cl. 222-395.000.
Spaller, Albert E., Jr., to Eastman Kodak Company. Apparatus for supporting and clamping knives on a rotary cutter. 3,777,610, Cl. 83-678.000.
Span, Samuel; and Thum, Walter. Toy. 3,777,392, Cl. 46-17.000.
Spanset Inter AG: *See—*

Carr, David William Bentley, 3,778,095.

Sparks, Albert. Damper control mechanism. 3,777,974, Cl. 236-49.000.

Speakman, Edwin L.: *See—*
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Speedcheck Systems, Inc.: *See—*
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Spencer, Ambrose: *See—*
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Sperry Rand Corporation: *See—*
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Spier, Raymond A., to United States of America, National Aeronautics and Space Administration. Vee-notching device. 3,777,605, Cl. 83-452.000.

Spindler, Gerhard: *See—*
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Spiral Tubing Corporation: *See—*
D'Onofrio, Mario L., 3,777,343.

Spiroch, Franz; and Ostwald, Heinz G., to Eichner Organisation KG. Apparatus for applying filmed images to punched cards and components for such apparatus. 3,777,997, Cl. 242-55.530.

Spolair Engineering Systems AG: *See—*
Tailor, Framodkumar Chhaganlal, 3,777,806.

Spring Associates, Inc.: *See—*
Larkin, Sam, 3,777,322.

Spurgeon, Richard C. Texturing yarns by false twisting. 3,777,469, Cl. 57-140.00r.

Square D Company: *See—*
Davies, Terrence Ardern, 3,778,257.

Squibb, E. R., & Sons, Inc.: *See—*
Czaplinski, Thomas V., 3,777,780.
Ondetti, Miguel A.; Pluscec, Josip; Sheehan, John T.; Jorpes, Johan E.; and Mutt, Viktor, 3,778,429.
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St. George, Alfred: *See—*
Johnson, Kenneth O.; Kepf, Peter F.; and St. George, Alfred, 3,777,489.

Staab, Donald C., to Cardinal Industries, Incorporated. Supporting cutter assemblies for multiple grooving of pavement. 3,778,110, Cl. 299-39.000.

Staats, William A.; Bosley, Denis V.; Cook, John S.; and Yamasaki, Toshio, to Mattel, Inc. Toy vehicle with adjustable lap counter activator removably mounted thereon. 3,777,394, Cl. 46-202.000.

Staby, Paul A.: *See—*
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Standard Brands Incorporated: *See—*
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Standard Havens Systems Inc.: *See—*
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Standard Oil Company: *See—*
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Standard Pressed Steel Co.: *See—*
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Stanis, Eugene A.: *See—*
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Stanislav, Kabele; Ctibor, Doudlebsky; Frantisek, Jaros; Zdenek, Svec; and Bohumir, Brozek, to Vyzkumny ustav bavlnarsky. Method of removing impurities and similar matter from staple fibres in ringless spinning and device for performing said method. 3,777,66, Cl. 57-58.890.

Stanley Works, The: *See—*
Schultheiss, Paul C., 3,777,620.

Stansfield, James Frederick; and Topham, Arthur, to Imperial Chemical Industries Limited. Pigment dispersions. 3,778,287, Cl. 106-308.00q.

Stanyon, Horace Edward: *See—*
Bleson, Eric John George; Furmidge, Kenneth Frederick; Stanyon, Horace Edward; and Speller, John Rueben Thomas, 3,778,663.

Stark, Marvin: *See—*
Miller, Roy W.; Stark, Marvin; and Shaver, William R., 3,777,671.

Starkey, Donald L.: *See—*
Schmitt, Joseph W.; and Starkey, Donald L., 3,778,606.

Starr, Anthony J.; Shindel, Gustave A.; and Keith, Harry G., Jr., to Container Corporation of America. Rotational moulding machine with inner and outer mold edges rotating about intersecting axes. 3,778,215, Cl. 425-435.000.

Stasko, William: *See—*
Lyne, Cornelius M.; Kasak, August; and Stasko, William, 3,778,253.

Statitrol Corporation: *See—*
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Staub, Hans-Rudolf: *See—*
Thalmann, Eduard; and Staub, Hans-Rudolf, 3,778,296.

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Stebbins, William W.: *See—*
Gicca, Francis A.; Passavant, Francis C.; Stebbins, William W.; and Worters, Allen J., 3,778,811.

Stedman, Robert N.; Griffith, Bobby D.; and Sullivan, Robert J., to Caterpillar Tractor Company. Conveyorized motor grader blade with retractable end bits. 3,777,822, Cl. 172-33.000.

Steelastic Company, The: *See—*
Alderfer, Sterling W., 3,778,329.

Steenmetser, Jean Louis, to LCC CICE-Compagnie Europeene des Composants Electronique. Transmission line of low characteristic impedance. 3,778,735, Cl. 333-84.00m.

Stefani, Elio: *See—*
Taralli, Claudio; and Stefani, Elio, 3,778,519.

Stegmeier, William J. Form structure. 3,778,019, Cl. 249-189.000.

Steidinger, Donald J., to Wallace Business Forms, Inc. Stuffed sealed envelope assembly and method. 3,777,971, Cl. 229-68.00r.

Steiger, Klaus: *See—*
Gruniger, Fritz; Muller, Gunther; and Steiger, Klaus, 3,778,005.

Stein, Lawrence, to United States of America, Atomic Energy Commission. Atmosphere purification of radon and radon daughter element. 3,778,499, Cl. 423-210.000.

Stein, Michel Guy Pierre, to Telecommunications Radioelectriques et Telephoniques. Receiver for data signals, including an automatic line correction circuit. 3,778,722, Cl. 325-414.000.

Steinberg, Adalberto Sussman. Buckle for shoes and the like. 3,777,337, Cl. 24-191.000.

Steinemann, Samuel G., to Institut Dr. Ing. Rainhard Straumann AG. Tension band. 3,777,346, Cl. 29-180.000.

Steiner, Walter: *See—*
Reber, Harald; Jahnke, Horst; and Steiner, Walter, 3,778,313.

Stengelin, Johann Conrad. Trickling filter plant. 3,777,891, Cl. 210-150.000.

Stevens, George S. Electronic weight monitor. 3,778,808, Cl. 340-282.000.

Stevens, John H., to United States Steel Corporation. Gas turbo-blower apparatus for generating and delivering combustion gases and reduction gases to a blast furnace. 3,778,045, Cl. 266-29.000.

Stevens, John H., to United States Steel Corporation. Jet engine powered blower for supplying combustion blast gas and reducing gas to a blast furnace. 3,778,046, Cl. 266-29.000.

Stevens, John H., to United States Steel Corporation. Apparatus for generating and delivering combustion gases and reduction gases to a blast furnace. 3,778,047, Cl. 266-29.000.

Stewart, Joseph T., Jr.: *See—*
Graves, Gail W.; Pope, Gerald R.; Stewart, Joseph T., Jr.; and Petrosky, Willard L., 3,778,028.

Stewart-Warner Corporation: *See—*
Yello, Joseph F., 3,778,720.

Stieler, Alfred Otto Hugo; and Billmann, Gerhard Leonhard Emil, to Bunker Ramo Corporation. Closure for a connector box. 3,777,926, Cl. 220-29.000.

Stillman, Albert H., Jr. Swimming pool coping. 3,777,318, Cl. 4-172.210.

Stilwell, Stanley O.: *See—*
Hake, Victor E.; McDowell, Allen W.; Mersel, Daniel R.; Mosher, Lawrence G.; and Stilwell, Stanley O., 3,778,779.

Stirton, Alfred L. Locking belt. 3,777,586, Cl. 74-231.00j.

Stocker, August, to Lonza Ltd. Production of acetoacetyl amides. 3,778,474, Cl. 260-561.00k.

Stockton, Frank R.: *See—*
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Stokes, Lyle S., to Hughes Aircraft Company. Coherent CATV transmission system. 3,778,716, Cl. 325-49.000.

Stoltman, Donald D., to General Motors Corporation. Gas turbine fuel control. 3,777,480, Cl. 60-39.28r.

Stolzmann, Hans; and Stolzmann, Hans-Joachim. Device for removing packaging bags in stacks from a collector located downstream of the delivery drum of a packaging bag machine. 3,777,906, Cl. 214-1.0bd.

Stolzmann, Hans-Joachim: *See—*
Stolzmann, Hans; and Stolzmann, Hans-Joachim, 3,777,906.

Stone, Kenneth F., to United States of America, Atomic Energy Commission. High current cable engagement tool. 3,777,348, Cl. 29-203.00p.

Stoneback, David N.: *See—*
Lang, Robert J.; Holt, Eugene L.; and Stoneback, David N., 3,778,501.

Storey, William Arthur. Pulse capture unit and apparatus for controlling the blending of two flowable substances. 3,777,935, Cl. 222-16.000.

Stork, Harald: *See—*
Bergmeyer, Hans Ulrich; Bernt, Erich; Gruber, Wolfgang; Schmidt, Felix Helmut; and Stork, Harald, 3,778,350.

Stow, Robert H., to Minnesota Mining and Manufacturing Company. Tape. 3,778,306, Cl. 117-226.000.

Strand, Jack W. Tick-tack-toe-like light game with color changeable squares. 3,778,063, Cl. 273-130.0ab.

Strandell, Per-Olof. Punching apparatus. 3,777,601, Cl. 83-160.000.

Strathaus, John. Roasting pan. 3,777,654, Cl. 99-419.000.

Straughn, Robert O.: *See—*
Reinhart, Richard D.; and Straughn, Robert O., 3,778,520.

Strenglein, Harry F., to Sperry Rand Corporation. Short range monopulse marine search radar for small object detection. 3,778,827, Cl. 343-7.300.

Strickel, William R.: *See—*
Mesek, Frederick K.; Shepherd, Robert C.; Strickel, William R.; Liloia, Gerald J.; May, Louis F., Jr.; and Schiff, Norman, 3,777,758.

Strommer, Palmer K., to General Mills, Inc. Method of texturizing protein. 3,778,522, Cl. 426-511.000.

Strong-Scott Mfg. Co., The: *See—*
Phillips, David L., 3,777,810.

Stuart, Gerald L., to Forrest Paschal Machinery Company. Brick conveyor. 3,777,873, Cl. 198-35.000.

Stumpf, Clarence E., Jr.: *See—*
Breuner, James H.; and Stumpf, Clarence E., Jr., 3,778,000.

Stumphauzer, William C.: *See—*
Rood, Alvin A.; Hogstrom, Edwin F.; and Stumphauzer, William C., 3,778,292.

Stumpp, Gerhard; and Schuster, Gregor, to Bosch, Robert, G.m.b.H. Means for varying the air-fuel ratio in a fuel injection system for internal combustion engines. 3,777,725, Cl. 123-119.00r.

Sturgeon, Donald L. G., to Du Pont de Nemours, E. I., and Company. High modulus organic fiber layers alternating with inorganic fiber layers in a resin matrix. 3,778,334, Cl. 161-156.000.

Sturm, Hans-Juergen; and Tritschler, Claus, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of 1,2,3,3-tetra-substituted indoleninium salts. 3,778,448, Cl. 260-315.000.

Sturm, Ruger & Co., Inc.: *See—*
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Sugahara, Eisuke, to Nippon Piston Ring Kabushiki Kaisha. Fluid operated coupling device. 3,777,868, Cl. 192-88.00b.

Sugano, Tadashi: *See—*
Kobayashi, Akira; Sugano, Tadashi; Koike, Toshio; and Sakata, Minehiro, 3,778,622.

Sugino, Osakazu: *See—*
Ushiyama, Rintaro; Sugino, Osakazu; Haga, Teruhide; and Horigome, Koichi, 3,778,268.

Sugita, Kenichiro; Shimizu, Tetsuji; Ueno, Sinichi; and Muraoka, Tateki, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Ophthalmic diagnostic instrument. 3,777,738, Cl. 128-2.00t.

Sugiura, Shotaro; Ueno, Haruo; Kono, Minoru; and Hamada, Hisawaki, to Ube Industries Ltd. Process for the preparation of 1,2-polybutadiene. 3,778,424, Cl. 260-94.300.

Sullivan, Robert J.: *See—*
Stedman, Robert N.; Griffith, Bobby D.; and Sullivan, Robert J., 3,777,822.

Sulzer Brothers Limited: *See—*
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Sumitomo Chemical Co., Ltd.: *See—*
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Sumitomo Chemical Company, Ltd.: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Hirohashi, Toshiyuki; Yamamoto, Michihiro; Ishizumi, Kikuo; Akatsu, Mitsuhiro; Maruyama, Isamu; Kume, Yoshiharu; Mori, Kazuo; and Izumi, Takahiro, 3,778,433.

Sun Research and Development Co., mesne: *See—*
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Super Chuck Company, Inc.: *See—*
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Surfalloy Corporation: *See—*
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Surkov, Ivan Efimovich: *See—*
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Surprenant, Ronald J.: *See—*
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Susoev, Yasha A. Roman shade and method of fabrication. 3,777,800, Cl. 160-84.00r.

Sutherland, George S.; and Hoskins, Randel L., to Rocket Research Corporation. Crash restraint matrix inflation system. 3,778,084, Cl. 280-150.0ab.

Sutt, Robert Francis: *See—*
Urbanic, John Emery; and Sutt, Robert Francis, 3,778,387.

Suzuki, Akio: *See—*
Miyala, Akira; Tomita, Chikayoshi; Suzuki, Akio; Okubo, Hideyo; and Magakuni, Masahiko, 3,778,356.

Suzuki, Etzuki: *See—*
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Suzuki, Isamu; Ohmura, Jukichi; and Satoo, Yuukoo, to Asahi Kasei Kogyo Kabushiki Kaisha. Method of forming a yarn package. 3,777,470, Cl. 57-157.00r.

Suzuki, Katsuo, to Xerox Corporation. Fire prevention apparatus. 3,778,222, Cl. 432-35.000.

Svenska Rotor Maskiner Aktiebolag: *See—*
Lundstrom, Jan-Horje; Nyberg, Ake; Hamlin, Roland; and Astberg, Ake, 3,777,723.

Swanberg, Melvin E., to Xerox Corporation. Linear actuator. 3,777,578, Cl. 74-89.000.

Sweeney, Donald E., Jr., to Texaco Inc. Means and method for achieving an optimum operating condition for an alkylation unit. 3,778,603, Cl. 235-151.120.

Swenson, Robert W. Tie rack device. 3,777,894, Cl. 211-13.000.

Swift, Harold E.: *See—*
Taylor, Brian W.; and Swift, Harold E., 3,778,462.

Swiss Aluminium Ltd.: *See—*
Laube, Max, 3,777,457.

Szabo, Andras I.; Zitelli, William E.; and Tarli, Dan V., to Westinghouse Electric Corporation. Analog to pulse rate converter. 3,778,794, Cl. 340-174.10a.

Szeles, Donald M.: *See—*
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Szohatsky, Zoltan L. Ski binding mounting apparatus. 3,778,048, Cl. 269-10.000.

Szoke, Abraham: *See—*
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Tachisto Inc.: *See—*
Chase, Charles Elroy, Sr., 3,778,636.

Tahara, Goro R.: *See—*
Mees, James G.; Lubarsky, Andre, Jr.; and Tahara, Goro R., 3,778,556.

Tailor, Framodkumar Chhaganlal, to Spolair Engineering Systems AG. Climatization plant. 3,777,806, Cl. 165-19.000.

Takagi, Moriyuki. Fluid pressure device. 3,778,197, Cl. 418-61.000.

Takahashi, Isoji: *See—*
Sato, Masamichi; Takimoto, Masaaki; Takahashi, Isoji; and Komaki, Takao, 3,778,623.

Takahashi, Koji, to Nippon Toki Kabushiki Kaisha. Apparatus for forming and finishing ceramic ware foot. 3,778,212, Cl. 425-264.000.

Takahashi, Nobuyuki; Nagata, Shuji; Nishimara, Toshiro; and Yoshinari, Kazuhiko, to Nippon Steel Corporation. Steel sheet and strip for use in the manufacture of easy-to-open cans. 3,777,536, Cl. 72-365.000.

Takahashi, Noriyuki; Inoue, Hidehiko; and Toshimitsu, Yoshihiko, to Honda Giken Kogyo Kabushiki Kaisha. Automatic control system for stability of a vehicle. 3,778,081, Cl. 280-112.00a.

Takahashi, Takashi; and Hayashi, Teru. Intermediate gear. 3,777,588, Cl. 74-440.000.

Takahashi, Torataro, to Elmo Company, Limited. Pulse synchronizing system for motion picture apparatuses. 3,778,136, Cl. 352-17.000.

Takahashi, Toru; and Kaneko, Kohei, to Yamaichi Denki Kogyo K.K. (Yamaichi Electric Mfg. Co., Ltd.). Socket for integrated circuit. 3,778,754, Cl. 339-176.000.

Takama, Eizo: *See—*
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Takamori, Kazumi: *See—*
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Takano Seimitsu Kogyo Co., Ltd.: *See—*
Takano, Tetsuo, 3,777,796.

Takano, Tetsuo, to Takano Seimitsu Kogyo Co., Ltd. Screw rod with washer. 3,777,796, Cl. 151-38.000.

Takarada, Eiichi, to Amsted Industries Incorporated. Arc control. 3,778,579, Cl. 219-69.00s.

Takatori Machinery Works Ltd.: *See—*
Horita, Teruyuki, 3,777,681.

Takenaka, Shigeo; Kido, Yasuji; Shimabara, Tatsutoshi; and Ogawa, Masanobu, to Nippon Kayaku Co., Ltd. Oxidation catalyst for oxidation of olefins to unsaturated aldehydes. 3,778,386, Cl. 252-432.000.

Takeuchi, Hiroo: *See—*
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Takeuchi, Seiji: *See—*
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Takimoto, Masaaki: *See—*
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Talbot, Jean-Guy, to Bombardier Limited. Clutch. 3,777,583, Cl. 74-230.17e.

Tamagni, Albert J.: *See—*
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Tanaka, Shinsaku: *See—*
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Tanaka, Takashi. Magnetic antenna having a block or circuit components therein. 3,778,836, Cl. 343-702.000.

Tanaka, Tetsuo: *See—*
Arai, Fumiaki; Ohta, Wasaburo; Kurokawa, Junji; Osui, Noriyuki; Shimizu, Sakae; and Tanaka, Tetsuo, 3,778,263.
Arai, Fumiaki; Ohta, Wasaburo; Kurokawa, Junji; Osui, Noriyuki; Shimizu, Sakae; and Tanaka, Tetsuo, 3,778,264.

Tanaka, Yoshiaki: *See—*
Matsuda, Kazuo; Tanaka, Yoshiaki; and Sakai, Takeyo, 3,778,480.

Tange, Fumiko; and Tsuda, Kiichi. Apparatus drawing-out for winding tape. 3,777,962, Cl. 226-129.000.

Taralli, Claudio; and Stefani, Elio, to Carle & Montanari S.p.A. Process for the impregnation treatment and eventual sterilization of cocoa seeds or beans with water or alkaline solutions. 3,778,519, Cl. 426-352.000.

Tarli, Dan V.: *See—*
Szabo, Andras I.; Zitelli, William E.; and Tarli, Dan V., 3,778,794.

Tatian, Berge, to Itek Corporation. Lens system having at least one thin, highly deformed plate with aspherical surfaces. 3,778,133, Cl. 350-2.000.

Tawara, Victor. Tree carrying vehicle. 3,778,098, Cl. 296-3.000.

Taylor, Brian W.; and Swift, Harold E., to Gulf Research & Development Company. Olefin hydrocyanation reaction. 3,778,462, Cl. 260-465.300.

Taylor, Richard Alan, to Birmingham Small Arms Company Limited, The. Method of producing silicon nitride articles. 3,778,231, Cl. 423-290.000.

Taylor, Richard F.; and Dimitriou, Christos, to Anglo-Transvaal Consolidated Investment Company, Limited. Control mechanism for rock cutting equipment. 3,778,106, Cl. 299-1.000.

Taylor, Richard F., to Anglo-Transvaal Consolidated Investment Company, Limited. Rock breaking equipment. 3,778,113, Cl. 299-86.000.

Technicolor Inc.: *See—*
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Techno-Med, Limited: *See—*
Pullman, Burke Cole, 3,778,033.

Teijin Limited: *See—*
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Telattach, Inc.: *See—*
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Telecommunication Industries, Inc.: *See—*
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Telecommunication Technology, Inc.: *See—*
Mees, James G.; Lubarsky, Andre, Jr.; and Tahara, Goro R., 3,778,556.

Telecommunications Radioelectriques et Telephoniques: *See—*
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Telecommunications Technology, Inc.: *See—*
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Teledyne Industries, Inc.: *See—*
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Teledyne McCormick Selph: *See—*
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Telefonaktiebolaget L M Ericsson: *See—*
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Templer, Milton: *See—*
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Tenneco Chemicals, Inc.: *See—*
Farber, Elliott; Rosen, Milton K.; and Shah, Ashok C., 3,778,422.
Minieri, Pasquale P., 3,778,400.

Tenneco Inc.: *See—*
Samalon, Eugene J.; Lamb, Gilbert C., Jr.; and Lentz, Ervin C., 3,777,852.

Tenner, Oskar, to Gravicast Patentverwertungsgesellschaft m.b.H. Casting apparatus. 3,777,801, Cl. 164-337.000.

Terakado, Ituko: *See—*
Watanabe, Shigeru; Yokozawa, Norio; Yabuuchi, Shigeru; and Terakado, Ituko, 3,778,607.

Terryn, Raymond M. F., to International Standard Electric Corporation. Jamming detection. 3,778,629, Cl. 250-557.000.

Teruuchi, Yoshifumi; Namiki, Masayuki; and Nishii, Tomio, to Matsushita Electric Industrial Co., Ltd. Automatic player for tape cassettes. 3,778,066, Cl. 274-4.00f.

Tewarson, Dinesh K.: *See—*
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Texaco Inc.: *See—*
Feuerbacher, David George; and Smith, Mary Kay Hrncir, 3,777,818.
Hubby, Laurence M.; and Mayer, Herbert J., 3,778,694.
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Texas Instruments, Incorporated: *See—*
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Texico Inc.: *See—*
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Textron, Inc.: *See—*
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Thalmann, Eduard; and Staub, Hans-Rudolf, to Lonza Limited. Process for the production of silicon carbide whiskers. 3,778,296, Cl. 117-106.00c.

Tharman, Paul A., to Briggs & Stratton Corporation. Battery charging regulator-rectifier module. 3,778,650, Cl. 310-68.00d.

Theakston, Harry A.: *See—*
Matievich, William; and Theakston, Harry A., 3,777,358.

Theodore, Paris. Gunsight. 3,777,380, Cl. 42-1.008.

Theodore, Paris, to Seventrees, Ltd. Secure holster for revolvers. 3,777,952, Cl. 224-2.00b.

Theodore, Paris, to Seventrees, Ltd. Cartridge pouch. 3,777,954, Cl. 224-19.000.

Thieme, Gerhard: *See—*
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Thiery, Jean: *See—*
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Thiery, Jean; and Grolet, Pierre, to Institut Francais du Petrole, des Carburants et Lubrifiants. Drilling apparatus. 3,777,827, Cl. 175-103.000.

Thijssen, Henricus A. O. Apparatus for the separation and treatment of solid particles from a liquid suspension. 3,777,892, Cl. 210-178.000.

Thillen, Hans: *See—*
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Thiokol Chemical Corporation: *See—*
Bertozzi, Eugene R., 3,778,478.
Ritchey, Harold W., 3,777,387.

Thomas, Alan; and Heath, Ronald Alfred, to Lucas, Joseph, (Industries) Limited. Fluid pressure transducers. 3,777,570, Cl. 73-398.00c.

Thomas, Roland C.: *See—*
Schaefer, Langdon C.; and Thomas, Roland C., 3,777,848.

Thomasian, Harvey A., to Lowell Corporation. Rotation limiting device. 3,777,591, Cl. 74-576.000.

Thompson Chemicals, Inc.: *See—*
Thompson, Henry C., 3,778,304.

Thompson, Don D., to Chevron Research Company. Dielectric constant measurement method. 3,778,706, Cl. 324-61.00r.

Thompson, Henry C., to Thompson Chemicals, Inc. Magnesium oxychloride fireproofing. 3,778,304, Cl. 117-138.000.

Thompson, Ralph F., to Salco, Inc. Liquid distributing system for sprinkler pans. 3,777,988, Cl. 239-553.300.

Thomson-CSF: *See—*
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Thorn Electrical Industries, Limited: *See—*
Bleson, Eric John George; Furmidge, Kenneth Frederick; Stanyon, Horace Edward; and Speller, John Rueben Thomas, 3,778,663.

Thorner, Robert H. Automotive speed control system. 3,777,841, Cl. 180-108.000.

Thum, Walter: *See—*
Span, Samuel; and Thum, Walter, 3,777,392.

Tidwell, Danny R.: *See—*
Burkhardt, Joseph A.; Childers, Thomas W.; Koerner, Roger J.; Mason, John P.; and Tidwell, Danny R., 3,777,812.

Tigges, Gerhard, to Tigges, Lebrecht, K.G., Firma. Closing device in particular for dyeing spindles. 3,777,516, Cl. 68-198.000.

Tigges, Lebrecht, K.G., Firma: *See—*
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Timesavers, Inc.: *See—*
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Timmler, Helmut: *See—*
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Timmons, Richard J.; and Gallant, William E., to Scott, O. M., & Sons Company, The. Phenoxyalkyloxazolines. 3,778,445, Cl. 260-307.00f.

Tischuk, Walter, to Robertson, H. H., Company. Complementary mating elements for double-skin foam cure panel. 3,777,430, Cl. 52-309.000.

Titan Textile Machines A/S: *See—*
Fleischer, Svend Sigurd Christie; and Jeppsson, Kind Helge, 3,777,339.

Tjujimoto, Kayoshi: *See—*
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Tobin, Michael F., to General Motors Corporation. Beaded tube with D-ring. 3,778,090, Cl. 285-222.000.

Todt, Hans-Gunther: *See—*
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Tokyo Daigaku: *See—*
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Tokyo Shibaura Electric Company Limited: *See—*
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Tolbert, William N., to Koehring Company. Pressure compensating valve mechanism. 3,777,773, Cl. 137-117.000.

Toledo, Emil, to United States of America, Navy. Use of cobalt in a nonorganic copper sulfate electroplating bath. 3,778,354, Cl. 204-44.000.

Tomei, Keichi: *See—*
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Tooming, Khugo Gustavovich; Kjulvya, Leopold Yakobovich; Gorschenin, Eduard Andreevich; and Nevalins, Arnold Yanovich. Machine for sewing up netting webs. 3,777,682, Cl. 112-121.150.

Topham, Arthur: *See—*
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Torii, Suichi. Bobbin exchange mechanism of a yarn winder. 3,777,996, Cl. 242-18.00r.

Toritani, Masatoshi. Method of collecting submarine resources. 3,777,377, Cl. 37-195.000.

Torkret GmbH: *See—*
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Torrington Company, The: *See—*

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Toyoda Koki Kabushiki Kaisha: *See—*
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Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
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Tracy, John William Franklin. Hollow vane shear. 3,777,603, Cl. 83-212.000.

Transformatoren Union Aktiengesellschaft: *See—*
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Trask, Blair D., to Bixby Box Toe Co., Inc. Shoe stiffener materials. 3,778,251, Cl. 117-68.000.

Trask, Donald R., to Union Carbide Corporation. Apparatus for forming a cylinder. 3,777,631, Cl. 93-81.00r.

Traumuller, Martin; and Hunneke, Fred, to Domestic Fabrics Corporation. Knitted fabric. 3,777,514, Cl. 66-196.000.

Treher, James E. Remote controlled slide changer for overhead projector. 3,778,143, Cl. 353-111.000.

Trenczek, Gerhard: *See—*
Bockmann, August; Trenczek, Gerhard; Rudolph, Hans; Wiegreffe, Wolfgang; and Ritter, Wolfgang, 3,778,289.

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Trienco, Inc.: *See—*
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Tsukihashi, Kazunobu: *See—*
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Tulloa, Aubrey R. Replaceable pen tips mounts. 3,778,843, Cl. 346-140.000.

Tummala, Rao R.: *See—*
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Tupalski, Alexander. Connecting links for chains. 3,777,476, Cl. 59-85.000.

Turbanti, Luigi. Heterocyclic amine esters of 2-phenol-cyclohexen-3-carboxylic acid. 3,778,442, Cl. 260-247.20b.

Turner, Robert Burton; and Poli, Emilio Lawrence, to Dow Chemical Company, The. Apparatus for cooling blown polymer films. 3,778,205, Cl. 425-71.000.

Turner, Thomas M.; Keefe, Francis J.; and Little, Charles D., to Ellicott Machine Corporation. Articulated ladder construction for cutterhead dredge. 3,777,376, Cl. 37-67.000.

Ty-Lok Assembly Systems, Inc.: *See—*
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Tyler, Derek E.: *See—*
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Tyler, Derek E.; and Shapiro, Stanley. Composite metal article. 3,778,238, Cl. 29-196.000.

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Uchino, Mitsuo: *See—*
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Uchiyama, Hiromichi; and Inoue, Naohiko, to Nissan Motor Company, Limited. Hydraulic-power control device for power-assisted steering system. 3,777,839, Cl. 180-79.200.

Ueba, Akio: *See—*
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Ueda, Hiroshi: *See—*
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Ueki, Massaaki: *See—*
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Ueno, Shinichi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Counting device having memory-readout and logic circuits. 3,777,769, Cl. 133-8.00r.

Ueno, Sinichi: *See—*
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Ulrich, Donald Aloysious, Jr., to Procter & Gamble Company, The. Hydrolytically unstable polyurethane foams. 3,778,390, Cl. 260-2.5an.

Umbaugh, Charles Wayne, to Honeywell Information Systems, Inc. Circuit chips having beam leads attached by film strip process. 3,777,365, Cl. 29-591.000.

Umehara, Akira: *See—*
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National Aeronautics and Space Administration; administrator; with respect to an invention of:
Cummingham, Herbert R. Potable water dispenser. 3,777,942, Cl. 222-309.000.
Haynes, Johnny L.; Wages, Charles G.; and Haralson, Hamilton S. Ultrasonic scanning system for in-place inspection of brazed tube joints. 3,777,552, Cl. 73-67.80s.
Lipoma, Phillip C. Data storage, image tube type. 3,778,786, Cl. 340-173.0cr.
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Urbanic, John Emery; and Sutt, Robert Francis, to Calgon Corporation. Activated carbon with antioxidant properties and a method of preparing the same. 3,778,387, Cl. 252-428.000.

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Schroder, Jurgen; Ochel, Gunter; and Von Horsten, Hans-Joachim, 3,778,549.

Ushiyama, Rintaro; Sugino, Osakazu; Haga, Teruhide; and Horigome, Koichi, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide photographic material. 3,778,268, Cl. 96-74.000.

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Vaille, Madeleine, born Penciolelli, to Societe anonyme dite: ORSYMONDE. Derivatives of phloroglucinol for causing an antispasmatic effect. 3,778,507, Cl. 424-340.000.

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Valtonen, Rainer Ilkka Tapio, to Oy Nokia Ab. Contact rail unit. 3,778,746, Cl. 339-21.00r.

Van Benschoten, Peter J.; and Kilsdonk, Jan Albert, to Oak Industries Inc. Indicator assembly with interlocking contact. 3,778,820, Cl. 340-381.00r.

Van Der Waaij, Dirk; Erkelens, Hendrik J.; Bossers, Pieter A.; and Kruiswijk, Franciscus J., to Nederlandse Organisatie voor Toegepast Natuurwetenschapplijk Orderzoek ten behoeve van de Volksgezondheid. Transporter for substantially germfree transport of bg living organisms. 3,777,736, Cl. 128-1.00r.

Van Dyke, Le Roy L.: *See—*
Kubli, Robert A.; Sasse, Frederick H.; Uttrachi, Gerald D.; Van Dyke, Le Roy L.; and Nakabayashi, Masahiro, 3,778,587.

Van Huffel, Isadore E. Maintenance means for tape player cabinets. 3,777,330, Cl. 15-421.000.

Van Manen, Jacob Teunis Teunissen, to Conical Containers Company (Proprietary) Limited. Apparatus for sealing plastic containers. 3,777,454, Cl. 53-373.000.

Van Roucke, L., to N.V. Bekaert S.A. Apparatus for vaporizing metal on a substratum. 3,777,704, Cl. 118-49.100.

Van Thyne, Ray J.: *See—*
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Van Uitert, Legrand Gerard: *See—*
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Vanderpool, James L.; and Dobras, Bruce W., to Monarch Marking Systems Company, The. Record reading system. 3,778,597, Cl. 235-61.11e.

Vaneerden, Dick. High amperage switch apparatus with resiliently mounted fluid cooled terminals. 3,778,680, Cl. 317-100.000.

Vaskor Industries, Inc.: *See—*
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VEB Pentacon Dresden Kamera- und Kinowerke: *See—*
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Velsicol Chemical Corporation: *See—*
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Vereinigte Farbenglasereke Aktiengesellschaft: *See—*
Ranel, Josef, 3,778,246.

Vereschagin, Leonid Fedorovich; Konyaev, Jury Sergeevich; Polyakov, Evgeny Valentinovich; and Surkov, Ivan Efimovich. High-pressure plunger compressor. 3,778,196, Cl. 417-501.000.

Vermeer, Dick Charles; and Washington, James MacKnight, to Allied Chemical Corporation. Electronic-pneumatic yarn plug control for yarn texturing device. 3,777,338, Cl. 28-1.700.

Viamonte, Manuel, Jr., to Hyperion Incorporated. Angiographic cradle. 3,778,049, Cl. 269-323.000.

Vickers, Stanley E.: *See—*
Schieser, Warren J.; and Vickers, Stanley E., 3,777,913.

Victor Company of Japan, Limited: *See—*
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Victor Metal Products Corporation: *See—*
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Vidar Laboratories, Inc.: *See—*
Campman, James P.; and Linscott, Jack H. (said Campman assor. of 1/2 to said), 3,778,795.

Viersma, Taco Jan: *See—*
Blok, Petrus; and Viersma, Taco Jan, 3,777,621.

Viglione, Gaetano Thomas. Alloy of tin, silver and nickel. 3,778,259, Cl. 75-134.00b.

Viola, Thomas J., Jr.: *See—*
Mattauch, Robert J.; and Viola, Thomas J., Jr., 3,778,645.

Visser, Gerrit A.: *See—*
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Vissers, H., N.V.: *See—*
De Koning, Cornelis J., 3,777,992.

Visual Graphics Corporation: *See—*
Friedel, Murray, 3,777,634.

Vock, Richard C.: *See—*
Gundlach, Robert W.; and Vock, Richard C., 3,778,841.

Voget, Ronald F., to Agridustrial Electronics, Inc. Means for measuring loss tangent of material for determining moisture content. 3,778,707, Cl. 324-61.00r.

Vogt, Kuno J. Canine feces disposal mechanism. 3,777,708, Cl. 119-1.000.

Volk, Karl Erich: *See—*
Carlyle, Bert Edward; Rawlings, Robert Louis; and Volk, Karl Erich, 3,778,767.

Volkland, Charles M.: *See—*
Lubarsky, Andre, Jr.; and Volkland, Charles M., 3,778,704.

Von Freyhold, Helmut, to Henkel & Cie G.m.b.H. Binders based on alkali metal silicates. 3,778,283, Cl. 106-84.000.

Von Gutfeld, Robert Jacob, to International Business Machines Corporation. Method for writing information at nanosecond speeds and a memory system therefor. 3,778,785, Cl. 340-173.01s.

Von Horsten, Hans-Joachim: *See—*
Schroder, Jurgen; Ochel, Gunter; and Von Horsten, Hans-Joachim, 3,778,549.

Vora, Madhukar B.: *See—*
Chang, Joseph J. F.; and Vora, Madhukar B., 3,778,687.

Vornberger, George F.; and Albaugh, Arden A., to Pullman Incorporated. Apparatus for positioning of vehicle suspension. 3,778,079, Cl. 280-80.00b.

Vosskuhler, Heinz, to Heinz, Jeffrey, Manufacturing Co., Inc. Apparatus for compressing material. 3,777,658, Cl. 100-98.000.

Vyzkumny ustav bavlnarsky: *See—*
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Wakui, Toshio, to Fuji Denki Seizo Kabushiki Kaisha. Method of making cylindrical fuse. 3,777,370, Cl. 29-623.000.

Walker, Terence, to American Optical Corporation. Ophthalmometer having alternative viewing measuring systems and including improved contact lens holding means. 3,778,164, Cl. 356-124.000.

Wallace, Benjamin K.: *See—*
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Wallace Business Forms, Inc.: *See—*
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Wallace, Paul K.; and Wallace, Benjamin K., to Morrison, Dan, Meat Pies, Inc. Extruder for food products such as tamales. 3,778,209, Cl. 425-133.000.

Wallace, Richard R., to Harwald Company, The. Film inspection apparatus. 3,778,802, Cl. 340-260.000.

Wallace, Sam P., Co., Inc.: *See—*
Brewer, Jack J., 3,777,900.

Walsh, John A., to Honeywell Information Systems, Inc. Apparatus for providing improved identification of electrical terminals. 3,778,751, Cl. 339-113.00r.

Walsh, Joseph M., to United States of America, Atomic Energy Commission, mesne. Nuclear engine flow reactivity shim control. 3,778,344, Cl. 176-22.000.

Walter, Jurgen; and Hackforth, Bernhard. Combined clutch and flexible coupling. 3,777,865, Cl. 192-70.000.

Walters, Craig T.: *See*—
Mallozzi, Philip J.; Epstein, Harold M.; Walters, Craig T.; Applebaum, David C.; and Gallagher, William J., 3,778,585.

Walters, Ronnie G.; Markley, Theodore J.; and Jennings, Richard E., to Allen-Bradley Company. Feedback fault indicate circuit. 3,778,696, Cl. 318-565.000.

Walus, Aloysius N., to Du Pont de Nemours, E. I., and Company. Organosols of aziridinyl alkyl acrylate or methacrylate acrylic graft polymers. 3,778,403, Cl. 260-31.40r.

Wanesky, William R., to Western Electric Company, Incorporated. Apparatus for microscopically inspecting opposite sides of objects. 3,778,131, Cl. 350-81.000.

Wang, Chao Chen, to Sperry Rand Corporation. Base band pulse energy storage system. 3,778,732, Cl. 333-20.000.

Warner, Joseph S., to Metalogics Corporation, mesne. Automatic banking deposit machine. 3,778,596, Cl. 235-61.90r.

Warner-Lambert Company: *See*—
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Watanabe, Shigeru; Yokozawa, Norio; Yabuuchi, Shigeru; and Terakado, Ituko, to Hitachi, Ltd. Automatic scaling system. 3,778,607, Cl. 235-193.000.

Watanabe, Teruji; and Ishihara, Hideo, to Kokusai Denshin Denwa Kabushiki Kaisha. High-speed transmission system for magnetic bubbles. 3,778,789, Cl. 340-174.0tf.

Waters Instruments, Inc.: *See*—
Burton, Thomas A.; and Moberg, Allen W., 3,777,507.

Waters, James P., to United Aircraft Corporation. Hologram formation with a sparkle reference point source. 3,778,130, Cl. 350-3.500.

Wattiez, Daniel: *See*—
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Weatherhead Company, The: *See*—
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Weatherly, Gilbert L.; and Back, Paul, to Weck, Edward, & Company, Inc. Surgical clip applicator. 3,777,538, Cl. 72-410.000.

Weaver, Clarence W.; and Scroggins, Robert R., to Allied Chemical Corporation. LPG injection with surfactant for relieving permeability blocking. 3,777,820, Cl. 166-35.00r.

Webb, Jervis B., Company: *See*—
Dehne, Clarence A., 3,777,879.

Weber, Richard J.; and Franciscus, Leo C., to United States of America, National Aeronautics and Space Administration. Supersonic-combustion rocket. 3,777,490, Cl. 60-258.000.

Weber, Richard M.: *See*—
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Meeks, Merrtt R.; Monroe, Roger F.; and Weber, Richard M., 37,779,341.

Webster, Harold F.; and Harris, Lawrence A., to General Electric Company. Odone gas detector. 3,778,229, Cl. 23-254.00e.

Weck, Edward, & Company, Inc.: *See*—
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Weidener, Richard A.: *See*—
Fazioli, Chris T.; Sirota, Julius; and Weidener, Richard A., 3,778,399.

Weigert, Frank J., to Du Pont de Nemours, E. I., and Company. 2-Substituted-4,5-dicyanoimidazoles and their preparation from diaminomaleonitrile. 3,778,446, Cl. 260-309.000.

Weiner, David William, to Bell Telephone Laboratories, Incorporated. Single three-wire-port PBX intercom trunk circuit arrangement. 3,778,554, Cl. 179-18.0ad.

Weiner, Gershen. Building. 3,777,426, Cl. 52-92.000.

Weinert, Volker; Frankiewicz, Gerhard; and Engelac, Gunter, to Agfa-Gevaert Aktiengesellschaft. Apparatus for transporting and intermittently braking webs of paper or the like. 3,777,960, Cl. 226-33.000.

Weinstein, Frank, to Concord Fabrics Inc. Display stand for yard goods. 3,777,895, Cl. 211-44.000.

Weiss, Ronald B.: *See*—
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Weiss, Walter J., to Texaco Inc. Continuous recording viscometer. 3,777,551, Cl. 73-59.000.

Weisselberg, Edward B.; Worden, George M., Sr.; Lamp, William F.; and Lane, Alexander M., to Wyssmont Company, Inc. Nondusting, high temperature dryer. 3,777,409, Cl. 34-173.000.

Weissenfels, Franz: *See*—
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Welch, Eugene E., to General Motors Corporation. Friction welding process. 3,777,360, Cl. 29-470.300.

Welham, Brian H., to Bausch & Lomb, Incorporated. Reflective half-lens rectifier. 3,778,134, Cl. 353-5.000.

Wellman, Ellis M., to Weatherhead Company, The. Rotary fluid pump or motor. 3,778,200, Cl. 418-132.000.

Welsh, Joseph P.: *See*—
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Welz, Bernhard: *See*—
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Wenig, Norman B. Air distributor. 3,777,650, Cl. 98-40.00v.

Wennberg, Peder K., to Propulsion Systems, Inc. Controllable pitch propellers for marine vessels. 3,778,187, Cl. 416-95.000.

Wenzel, Heinz-Eckard: *See*—
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Werner, Georg: *See*—
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Petro, James; and Rively, Clair M., 3,778,664.
Roerty, Dennis F.; and MacIndoe, Robert C., 3,778,712.
Szabo, Andras I.; Zitelli, William E.; and Tarli, Dan V., 3,778,794.

Weston, Warren E.; and Cooke, Anson R., to Amchem Products, Inc. Chloramben products and processes for use with rice. 3,778,248, Cl. 71-115.000.

Weyerhaeuser Company: *See*—
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Wheaton, Theodore C.; Tamagni, Albert J.; and Moshinsky, Robert W., 3,778,223.

Wheaton, Theodore C.; Tamagni, Albert J.; and Moshinsky, Robert W., to Wheaton Industries. Device for injection blow molding PVC bottles. 3,778,223, Cl. 432-227.000.

Wheeler, Robert S.: *See*—
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Whitaker, William T. Remote meter reading apparatus. 3,778,771, Cl. 340-150.000.

White, Eugene T.; and McEnroy, Joseph H. Microfilm searching system. 3,778,630, Cl. 250-557.000.

Whitney, Robert J.; Gaston, Donald H.; and Nickell, Joe A. Machine and method for simultaneously forming a plurality of building sections. 3,777,357, Cl. 29-429.000.

Whitney, Walter D. Straightening apparatus for vehicle bodies. 3,777,541, Cl. 72-457.000.

Whittaker, Rodney R.: *See*—
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Wick, Richard; Brath, Alfred; and Wagensonner, Eduard, to Afga-Gevaert Aktiengesellschaft. Method and arrangement for sound track recording in which background music is damped during speech signals. 3,778,558, Cl. 179-100.2md.

Wickenden, Geoffrey Charles: *See*—
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Widhoff, Andre, to Frangeco, a Societe Anonyme Francaise. Device for stabilizing rear-tipping vehicles. 3,778,105, Cl. 298-17.00s.

Widmann, Werner, to Transformatoren Union Aktiengesellschaft. Insulating arrangement for increasing breaking voltage stability of high voltage instrumentalities. 3,778,538, Cl. 174-140.00r.

Wiechers, Herbert; and Heikaus, Reinhard, to Bayer Aktiengesellschaft. Electrolytic apparatus including bipolar electrodes defining an enclosed volume and held in a non-conductive frame. 3,778,362, Cl. 204-254.000.

Wiedhaber, Ernest. Optical scanner. 3,778,129, Cl. 350-6.000.

Wiegand, Donald A., to United States of America, Army. Method for use of inorganic azides as photosensitive materials at low temperatures. 3,778,269, Cl. 96-27.00r.

Wiegreffe, Wolfgang: *See*—
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Wieneck, Daniel Charles: *See*—
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Wiese, Delmar R., to Hoover Ball and Bearing Company. Apparatus for discharging top discharge bins. 3,777,920, Cl. 214-314.000.

Wightman, John W. Positive liquid temperature controlling device. 3,778,594, Cl. 219-430.000.
Wikstrom, Gunnar Wilhelm, to AB Bahco Ventilation. Electrical heating units. 3,778,593, Cl. 219-362.000.
Wilcox, Lyle C.: *See—*
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Wilhelm, Max; and Riess, Walter, to Ciba-Geigy Corporation. Aminoalkyl-ethanonthracenes. 3,778,467, Cl. 260-490.000.
Williams, Arthur B., to Singer Company, The. Crystal controlled frequency discriminator. 3,778,727, Cl. 329-104.000.
Williams, Donald D.: *See—*
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Williams, George J. Door position signalling system. 3,778,806, Cl. 340-274.000.
Williams Instruments, Inc.: *See—*
Williams, Robert A.; and Holt, David M., 3,778,709.
Williams, John Charles: *See—*
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Williams, Laurence Lyman; and Coscia, Anthony Thomas, to American Cyanamid Company. Paper containing a polyamidepolyamine-epichlorophydrin wet strength resin. 3,778,339, Cl. 162-164.000.
Williams, Michael, to Emerson Electric Co. Electric heating assemblies. 3,778,592, Cl. 219-336.000.
Williams, Robert A.; and Holt, David M., to Williams Instruments, Inc. Curve following stray energy test system. 3,778,709, Cl. 324-72.000.
Williams, Robert H. Rotary internal combustion engine. 3,777,720, Cl. 123-8.090.
Willner, Kurt. Apparatus for the control of traveling constructional implements. 3,778,168, Cl. 356-152.000.
Wilputte Corporation: *See—*
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Wilson, Donald M.: *See—*
Langston, Perry R., Jr.; Tummala, Rao R.; and Wilson, Donald M., 3,778,127.
Wilson, Donald Miller, to International Business Machines Corporation. Gas display panel without exhaust tube structure. 3,778,126, Cl. 316-20.000.
Wilson, George A., to I-T-E Imperial Corporation. Draw out switchgear-compartment shutter. 3,778,568, Cl. 200-50.0aa.
Wilson, Harold W., to Golden Cycle Corporation, The. Process for separation and recovery of gold. 3,778,252, Cl. 75-101.00r.
Wilson, Randy Eugene, to Litton Systems, Inc. Modular printed circuit board assembly. 3,778,681, Cl. 317-101.0dh.
Windmoller & Holscher: *See—*
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Winkler, Alfred; Lermann, Peter; and Fauth, Guenter, to Agfa-Gevaert AG. Photographic apparatus for use with percussively ignitable flash lamps. 3,777,641, Cl. 95-11.001.
Winkler, Alfred; Lermann, Peter; and Fauth, Guenter, to Agfa-Gevaert AG. Camera for use with percussively ignitable flash lamps. 3,777,642, Cl. 95-11.001.
Winter, Phillip M.; and Gardner, Gary A. Spheroidel peening particles adhesively bonded to a woven cloth. 3,778,241, Cl. 161-87.000.
Wisconsin Alumni Research Foundation: *See—*
Lodge, Arthur Scott, 3,777,549.
Wise, Elmo E. Ankle supports. 3,777,751, Cl. 128-166.000.
Witkowski, Henry J. Ball game. 3,778,055, Cl. 273-1.00r.
Witkowski, Henry J. Hat game. 3,778,056, Cl. 273-1.00r.
Witwer, Wallace J., to Harrischfeger Corporation. Bounce-preventing control for hydraulic cylinder. 3,777,899, Cl. 212-55.000.
Wloszek, Joseph T., to Custom Machine, Inc. Support for test head. 3,777,553, Cl. 73-71.500.
Woessner, Roger J., to Baxter Laboratories, Inc. Indicator device for collapsible fluid container. 3,777,697, Cl. 116-118.00r.
Wohlberg, Cornel, to United States of America, Atomic Energy Commission. Method of forming impermeable carbide coats on graphite. 3,778,300, Cl. 117-118.000.
Wohlberg, Cornel, to United States of America, Atomic Energy Commission. Method of coating graphite tubes with refractory metal carbides. 3,778,301, Cl. 117-118.000.
Wolcott, John R., to Martin Marietta Corporation. Electronic distance measuring device and method. 3,778,160, Cl. 356-5.000.
Wolda, Tiete Okke, to Boyles Industries Limited. Fluid responsive core barrel system. 3,777,826, Cl. 175-46.000.
Wolf, Leo. Adjustable joint for electrical fixtures. 3,778,610, Cl. 240-73.0bj.
Wolfe, Raymond: *See—*
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Wolff, Rafael I.: *See—*
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Wollensak, John C.; and Zaweski, Edward F., to Ethyl Corporation. Hydrocarbyl-hydroxyphenyl dithiocarbamates and their use as antioxidants. 3,778,460, Cl. 260-455.00a.
Wood, Donald Albert: *See—*
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Wood, Donald H., to United Aircraft Corporation. Vane damping. 3,778,184, Cl. 415-174.000.
Wood, Russell E., to Carrier Corporation. Control for air conditioning apparatus. 3,777,803, Cl. 165-2.000.
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Woolley, Donald D., to Gillette Company, The. Continuous process of manufacturing polymeric composition writing points and devices. 3,778,495, Cl. 264-177.00f.
Worden, Dexter: *See—*
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Worden, George M., Sr.: *See—*
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World Patent Development Corporation: *See—*
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Worley, Raymond Arnold. Wall construction device. 3,777,427, Cl. 52-127.000.
Worters, Allen J.: *See—*
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Wright, Carl Macey, to RCA Corporation. Keyboard encoder. 3,778,815, Cl. 340-365.00s.
Wright, James A.; and Forrest, Robert L., to Emerson Electric Co. Ignition and control systems for gas burners. 3,778,218, Cl. 431-67.000.
Wright, William Michael D., to Dayton Wright Associates Limited. Electrastatic loudspeaker having acoustic wavefront modifying device. 3,778,562, Cl. 179-111.00r.
Wuenschel, Paul C.: *See—*
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Wunsch, William K. Cigarette holder for ash receptacle. 3,777,767, Cl. 131-257.000.
Wyeth, Nathaniel Convers; and Roseveare, Ronald Newman, to Du Pont de Nemours, E. I., and Company. Apparatus for preparing a biaxially oriented thermoplastic article. 3,778,214, Cl. 425-326.000.
Wyles, Walter E., to Lightolier Incorporated. Collapsibly joined louver grid. 3,777,432, Cl. 52-668.000.
Wyssmont Company, Inc.: *See—*
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Yamahara, Takeshi; and Deguchi, Takashi, to Sumitomo Chemical Co., Ltd. Process for producing aliphatic carboxylic acids and aromatic carboxylic acids. 3,778,471, Cl. 260-524.00r.
Yamaichi Denki Kogyo K.K. (Yamaichi Electric Mfg. Co., Ltd.): *See—*
Takahashi, Toru; and Kaneko, Kohei, 3,778,754.
Yamamoto, Akira, to Kabushiki Kaisha Komatsu Seisakusho. Carry-out carriage device of peeling machine. 3,777,963, Cl. 226-175.000.
Yamamoto, Hisao; Inaba, Shigeho; Hirohashi, Toshiyuki; Yamamoto, Michihiro; Ishizumi, Kikuo; Akatsu, Mitsuhiro; Maruyama, Isamu; Kume, Yoshiharu; Mori, Kazuo; and Izumi, Takahiro, to Sumitomo Chemical Company, Ltd. Process for producing benzodiazepine deriatives. 3,778,433, Cl. 260-239.30d.
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Yamanoto, Akira; Yoshida, Dan; Onaka, Tatsumi; and Shiraishi, Minoru, to Hitachi Shipbuilding and Engineering Company Ltd. Abrasive slinging apparatus. 3,777,440, Cl. 51-9.000.
Yamasaki, Hiroo; Kurita, Yoshio; and Ito, Ichizo, to Yokogawa Electric Works, Ltd. Flow-velocity detecting device. 3,777,563, Cl. 73-194.00b.
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Yang, John F. Y. Decorative applique having air-actuated noisemaker. 3,777,310, Cl. 2-48.000.

Yano, Masayuki; Yamamoto, Iwao; and Yasuhira, Nobuo, to Kuraray Co., Ltd. Process for recovering uranium. 3,778,498, Cl. 423-7.000.

Yano, Seinosuke; Sakurai, Hiroshi; Wakita, Nobuo; and Mimura, Hiroshi, to Nippon Steel Corporation. Method for heat treatment of a thick steel plate. 3,778,317, Cl. 148-12.000.

Yasuda, Isao: *See—*
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Yata, Kotaro; Nanba, Yasuhiro; and Sahara, Masayoshi, to Minolta Camera Kabushiki Kaisha. Exposure control circuitry compensated for temperature and voltage fluctuations. 3,777,638, Cl. 95-10.0ct.

Yaun Manufacturing Company, Inc.: *See—*
Barber, Claude L., 3,777,918.

Yauneridge, Raymond. Valve. 3,778,022, Cl. 251-14.000.

Yeager, Weldon O. Safety garment structure. 3,777,309, Cl. 2-2.500.

Yello, Joseph F., to Stewart-Warner Corporation. Intermediate frequency amplifier circuit. 3,778,720, Cl. 325-318.000.

Yokogawa Electric Works, Ltd.: *See—*
Yamasaki, Hiroo; Kurita, Yoshio; and Ito, Ichizo, 3,777,563.

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Yoshinaga, Sadao, to Yoshinaga Prince Co., Ltd. Filter apparatus for removing tar and other deleterious substances from tobacco smoke. 3,777,765, Cl. 131-187.000.

Yoshinari, Kazuhiko: *See—*
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Yoshino Kogyosho Co., Ltd.: *See—*
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Yosim, Samuel J.; Grantham, Le Roy F.; and Huber, Donald A., to Rockwell International Corporation. Non-polluting disposal of explosives and propellants. 3,778,320, Cl. 149-109.000.

Young, David W. Aircraft contained perspective radar display and guidance for approach and landing. 3,778,821, Cl. 343-5.00r.

Young, Elgin E., to PPG Industries, Inc. Method and apparatus for temperature control of a rotating metal oxide scraper element. 3,777,802, Cl. 161-1.000.

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Youra, Charles J., to Doric Corporation. Die fixture and control apparatus. 3,777,602, Cl. 83-204.000.

Yuken Kogyo Company Ltd.: *See—*
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Zaccheo, John T. Personal sensitivity test method and apparatus therefor. 3,777,413, Cl. 35-22.00r.

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Zeliznak, Richard: *See—*
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Zellbeck, Gustav; Bosch, Paul; Veil, Karl; and Lutz, Gerhard, to Bosch, Robert, G.m.b.H. Arrangement for pumping a filtered fluid. 3,777,888, Cl. 210-130.000.

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Ziemba, Richard T., to General Electric Company. Fuze actuating system. 3,777,665, Cl. 102-70.20p.

Zimmer, Ernest C. Snap locking structural joint assembly. 3,778,175, Cl. 403-187.000.

Zimmermann, Helmuth; and Kielwein, Helmut, to Fr. Hesser Maschinenfabrik AG. Intermediate conveyor system for use with bagging and cartoning machines. 3,777,453, Cl. 53-251.000.

Zimmermann, Markus: *See—*
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Zimmet, Hans, to VEB Pentacon Dresden Kamera- und Kinowerke. Microfilm camera with longitudinal and cross slides movable in steps. 3,778,151, Cl. 355-53.000.

Zipper, Walter J. Traveler's bag. 3,777,862, Cl. 190-43.000.

Zitelli, William E.: *See—*
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Zlobin, Viktor Grigorievich: *See—*
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Zoller, Robert; Fester, Walter; Jakob, Franz; and Dahmen, Alexander, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the manufacture of filaments and fibers from acrylonitrile copolymers. 3,778,416, Cl. 260-78.0ua.

Zuckerman, Ira: *See—*
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Zuech, Ernest A., to Phillips Petroleum Company. Compounds of Mo or W with organometals as olefin reaction catalysts. 3,778,385, Cl. 252-431.00c.

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Andrews, John D.: *See*—
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Carmichael, Thomas, and D. U. Howard, to Sherwood Products Corp. Vehicle flush toilet. Re. 27,833, 12–11–73, Cl. 4—115.

Dahms, Francis A., to Emhart Corp. Triple gob settle blowhead and baffle construction. Re. 27,834, 12–11–73, Cl. 65—261.

Emhart Corp.: *See*—
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Globe-Union Inc.: *See*—
Hansen, Eric G. Re. 27,836.

Hansen, Eric G., to Globe-Union Inc. Multistation pushbutton switch assembly with master control means for alternative push-push or only one switch operable at a time modes of actuation. Re. 27,836, 12–11–73, Cl. 200—5.

Hoffmann, Arthur K.: *See*—
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Hyster Co.: *See*—
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Kronholm, Donald D., to Hyster Co. Tandem roller. Re. 27,840, 12–11–73, Cl. 404—122.

Leasure, William C., and J. D. Andrews, to Mira-Pak, Inc. Package. Re. 27,838, 12–11–73, Cl. 229—17.

Mack-Wayne Plastics Co.: *See*—
McIntosh, James A. Re. 27,837.

Maricle, Donald L., and A. K. Hoffmann, to American Cyanamid Co. Nonaqueous electro-chemical current producing cell having soluble cathode depolarizer. Re. 27,835, 12–11–73, Cl. 136—6.

McIntosh, James A., to Mack-Wayne Plastics Co. Plastic safety closure. Re. 27,837, 12–11–73, Cl. 215—9.

Mira-Pak, Inc.: *See*—
Leasure, William C., and Andrews. Re. 27,838.

Sherwood Products Corp.: *See*—
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Thate, Kurt: *See*—
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Winkler, Friederich, and K. Thate, to AGFA-Gevaert Aktiengesellschaft. Motion picture camera. Re. 27,839, 12–11–73, Cl. 242—205.

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Anderson, Victor F. Jug. 229,540, 12–11–73, Cl. D9—40.

Anderson, Victor F. Jug. 229,541, 12–11–73, Cl. D9—40.

Anielak, Gary L. Fish aquarium. 229,569, 12–11–73, Cl. D30—9.

Armbruster, John T., and A. Kenzian, to American Optical Corp. Microscope. 229,581, 12–11–73, Cl. D57—1.

Askew, Aubrey, to Dunlop Ltd. Shoe sole. 229,524, 12–11–73, D2—320.

Baskin-Robbins Inc.: *See*—
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Bell, Jack T. Demountable personnel cab for pickup trucks. 229,554, 12–11–73, Cl. D14—3.

Billingslea, Elmer O., Jr. Boot jack. 229,584, 12–11–73, Cl. D86—10.

Blake, Edwin T. Candle chandelier mobile. 229,576, 12–11–73, Cl. D48—2.

Bonk, Donald C., to United Aircraft Corp. Portable cuting torch. 229,536, 12–11–73, Cl. D8—98.

Brainard, James L., and R. J. Palm. Spider for a wheel. 229,558, 12–11–73, Cl. D14—30.

Browdy, Herman. Pants. 229,523, 12–11–73, Cl. D2—28.

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Colato, Albert E. and P. N. Daly, to Litton Systems, Inc. Microwave oven broiler rack. 229,532, 12–11–73, Cl. D7—136.

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Dallas, Charles G. Flower pot holder. 229,575, 12–11–73, Cl. D35—3.

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Ford, Henry A., D. R. Fleming, and J. F. King, to Lockheed Aircraft Corp. Articulated all terrain vehicle. 229,553, 12–11–73, Cl. D14—3.

Frost, Donald J. Holder for a token coin. 29,586, 12–11–73, Cl. D87—3.

Gallagher, Frank, and G. Perry, to Oxford Pendaflex Corp. Desk. 229,529, 12–11–73, Cl. D6—177.

Goldman, Arnold S., and D. K. Krumin, to Motorola, Inc. Radio pager or similar article. 229,567, 12–11–73, Cl. D26—14.

Gonzalez, Betty Jo. Toy dog. 229,572, 12–11–73, Cl. D34—2.

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Harvey, Franklin D. Comb. 229,583, 12–11–73, Cl. D86—8.

Heller, Karen G. Box. 229,550, 12–11–73, Cl. D9—198.

Hodge, Lynn H. Periscope-type rear view mirror. 229,556, 12–11–73, Cl. D14—6.

Hodge, Lynn H. Periscope-type rear view mirror. 229,557, 12–11–73, Cl. D14—6.

Horgan, William J., Jr. Door. 229,551, 12–11–73, Cl. D13—1.

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Johnson, Bennie J. Horse walker. 229,570, 12–11–73, Cl. D30—42.

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Kranz, Arnold H., to Curtis, Helene, Industries, Inc. Container for liquids. 229,548, 12–11–73, Cl. D9—169.

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Legorju, Charles, to Societe Audax. Baffled loud-speaker. 229,565, 12–11–73, Cl. D26—14.

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66 3,777,384
76R 3,777,385
84 3,777,387

CLASS 43
9 3,777,388
15 3,777,389
422GC 3,777,572

CLASS 46
1K 3,777,391
1L 3,777,390
17 3,777,392
25 3,777,393
202 3,777,394
243AV 3,777,395
3,777,420

CLASS 47
33 3,777,421

CLASS 48
105 3,778,240
214 3,778,239

CLASS 49
7 3,777,422
31 3,777,423
485 3,777,424

CLASS 51
9 3,777,440
105SP 3,777,441
135R 3,777,442
206.5 3,777,443
391 3,777,444

CLASS 52
2 3,777,425
92 3,777,426
127 3,777,427
146 3,777,428
173 3,777,438
196 3,777,429
309 3,777,430
562 3,777,431
668 3,777,432
693 3,777,433
753C 3,777,434
754 3,777,435
758C 3,777,436
758D 3,777,437

CLASS 53
3 3,777,439
14 3,777,445
30 3,777,446
36 3,777,447
43 3,777,449
47 3,777,448
138R 3,777,450
180 3,777,451
206 3,777,452
251 3,777,453
373 3,777,454
381A 3,777,455

CLASS 55
32 3,777,456
223 3,777,457
287 3,777,458

CLASS 56
15.3 3,777,459
16.7 3,777,460
202 3,777,461
328 3,777,462
330 3,777,463

CLASS 57
24 3,777,464
34HS 3,777,465
58.89 3,777,466
77.4 3,777,467
120 3,777,468
140R 3,777,469
157R 3,777,470

CLASS 58
23R 3,777,471
57.5 3,777,472
90B 3,777,474
90R 3,777,473
126B 3,777,475

CLASS 59
85 3,777,476
93 3,777,477

CLASS 60
39.16R 3,777,478
39.25 3,777,479
39.28R 3,777,480
3,777,482
3,777,483
39.28 3,777,481
39.65 3,777,484
95 3,777,485
105 3,777,486
204 3,777,487
3,777,488
226R 3,777,489
258 3,777,490
372 3,777,491
462 3,777,492
493 3,777,493
507 3,777,494
530 3,777,495
593 3,777,496

CLASS 61
46.5 3,777,497
69R 3,777,498
72.3 3,777,499
72.6 3,777,500

CLASS 62
45 3,777,501
55 3,777,502
62 3,777,503
73 3,777,504
81 3,777,505
237 3,777,506
306 3,777,507
324 3,777,508
470 3,777,509

CLASS 64
17A 3,777,510

CLASS 65
43 3,778,242
58 3,778,243
106 3,778,244
119 3,778,245
261 Re.27,834
360 3,778,246

CLASS 66
76 3,777,511
125R 3,777,512
140R 3,777,513
196 3,777,514

CLASS 68
198 3,777,515
3,777,516

CLASS 70
35B 3,777,520
53 3,777,517
200 3,777,518
220 3,777,519
364R 3,777,521
455 3,777,522
456R 3,777,523

CLASS 71
95 3,778,247
115 3,778,248

CLASS 72
8 3,777,524
22 3,777,525
35 3,777,526
36 3,777,527
41 3,777,528
57 3,777,529
102 3,777,345
129 3,777,530
181 3,777,531
205 3,777,532
3,777,533
208 3,777,534
293 3,777,535
365 3,777,536
391 3,777,540
404 3,777,537
410 3,777,538
453 3,777,539
457 3,777,541
3,777,542
465 3,777,543
468 3,777,544

CLASS 73
3 3,777,545
4R 3,777,546
6 3,777,547
12 3,777,548
53 3,777,549
59 3,777,550
3,777,551
67.8S 3,777,552
71.5 3,777,553
74.5U 3,777,554
91 3,777,555
94 3,777,556
95 3,777,557
105 3,777,558
117.3 3,777,559
151.5 3,777,560
181 3,777,561
190R 3,777,562
194B 3,777,563
194F 3,777,564
258 3,777,565
290R 3,777,566
351 3,777,567
355EM 3,777,568
389 3,777,569
398C 3,777,570
421.5 3,777,571
432R 3,777,573
453 3,777,574
483 3,777,575

CLASS 74
10.29 3,777,576
89 3,777,578
89.22 3,777,577
99 3,777,579
110 3,777,580
3,777,581
112 3,777,582
230.17D 3,777,585
230.17E 3,777,583
3,777,584
231J 3,777,586
424.8R 3,777,587
440 3,777,588
498 3,777,589
3,777,590
576 3,777,591
579E 3,777,592
687 3,777,593
3,777,594

CLASS 75
.5BC 3,778,249
58 3,778,250
101R 3,778,252
123R 3,778,253
3,778,254
126C 3,778,255
134B 3,778,259
134F 3,778,256
173A 3,778,257
173R 3,778,258
174 3,778,260
204 3,778,261

CLASS 76
107R 3,777,595

CLASS 81
177G 3,777,596

CLASS 83
22 3,777,597
29R 3,777,598
39 3,777,599
3,777,600
160 3,777,601
204 3,777,602
212 3,777,603
374 3,777,604
452 3,777,605
460 3,777,606
482 3,777,607
517 3,777,608
635 3,777,609
678 3,777,610

CLASS 84
1.25 3,778,525
204 3,777,611
258 3,777,612
297S 3,777,613

CLASS 89
26 3,777,614

CLASS 90
10 3,777,615
13.2 3,777,616

CLASS 91
44 3,777,617
61 3,777,618
216R 3,777,619
394 3,777,620
411R 3,777,629
431 3,777,621
479 3,777,622
487 3,777,623
488 3,777,624

CLASS 92
48 3,777,625
137 3,777,626
168 3,777,627

CLASS 93
37R 3,777,630
41.1 3,777,628
81R 3,777,631
94 3,777,632

CLASS 95
1R 3,777,633
4.5 3,777,634
10CD 3,777,637
10CT 3,777,635
3,777,636
3,777,638
11L 3,777,641
3,777,642
11R 3,777,639
3,777,640
12 3,777,643
31AC 3,777,644
49 3,777,645
53EB 3,777,646
89L 3,777,647

CLASS 96
1R 3,778,262
1.8 3,778,263
3,778,264
3 3,778,265
27R 3,778,269
36.1 3,778,266
66HD 3,778,267
74 3,778,268
75 3,778,270
77 3,778,271
84R 3,778,273
87R 3,778,272
91R 3,778,274
94R 3,778,276
94 3,778,275
100 3,778,277
114.8 3,778,278
140 3,778,279

CLASS 98
2.04 3,777,648
37 3,777,649
40V 3,777,650
115R 3,777,651

CLASS 99
275 3,777,652
339 3,777,653
419 3,777,654
532 3,777,655

CLASS 100
47 3,777,656
49 3,777,657
98 3,777,658
233 3,777,659

CLASS 101
77 3,777,660
114 3,777,661

CLASS 102
23 3,777,662
24HC 3,777,663
45 3,777,664
70.2P 3,777,665
80 3,777,666

CLASS 104
88 3,777,667
105 3,777,668
130 3,777,669
246 3,777,670

CLASS 105
420 3,777,671
453 3,777,672

CLASS 106
1 3,778,280
67 3,778,281
84 3,778,283
162 3,778,284
179 3,778,285
187 3,778,282
287R 3,778,286
308Q 3,778,287
3,778,288
3,778,289

CLASS 108
27 3,777,673
113 3,777,674
132 3,777,675

CLASS 110
8A 3,777,679
8R 3,777,676
3,777,677
3,777,678
12 3,777,680

CLASS 112
121.15 3,777,681
3,777,682
121.27 3,777,683
152 3,777,684
220 3,777,685
237 3,777,686

CLASS 113
54 3,777,687

CLASS 114
.5F 3,777,689

.5 3,777,688
39 3,777,690
48 3,777,691
54 3,777,692
117 3,777,693
126 3,777,694
207 3,777,695

CLASS 116

114.5 3,777,696
118R 3,777,697
3,777,698
120 3,777,699
137A 3,777,700
149 3,777,701

CLASS 117

8 3,778,290
21 3,778,291
43 3,778,292
68 3,778,251
93.1PF 3,778,293
93.31 3,778,294
99 3,777,715
100B 3,778,295
106C 3,778,296
107.2P 3,778,297
107.2R 3,778,298
109 3,778,299
118 3,778,300
3,778,301
122PB 3,778,302
136 3,778,303
138 3,778,304
212 3,778,305
221 3,778,307
226 3,778,306
234 3,778,308

CLASS 118

2 3,777,702
49 3,777,703
49.1 3,777,704
313 3,777,705
603 3,777,706
637 3,777,707

CLASS 119

1 3,777,708
3 3,777,709
17 3,777,710
23 3,777,711
29 3,777,712
60 3,777,713
75 3,777,714
159 3,777,716

CLASS 122

156 3,777,717

CLASS 123

8.01 3,777,718
8.07 3,777,719
8.09 3,777,720
8.45 3,777,721
8.47 3,777,723
46R 3,777,722
78B 3,777,724
119R 3,777,725
3,777,726
3,777,727
122D 3,777,728
140FG 3,777,729
3,777,731
140R 3,777,730

CLASS 124

1 3,777,732
7 3,777,733
24A 3,777,734

CLASS 126

120 3,777,735
510 3,778,523

CLASS 128

1R 3,777,736
3,777,737
2A 3,777,742
2B 3,777,743
2F 3,777,739
2T 3,777,738
2V 3,777,740
2 3,777,741
28 3,777,744
57 3,777,745
66 3,777,746
80A 3,777,747
130 3,777,748
132D 3,777,749
142.5 3,777,750
166 3,777,751
173 3,777,752
252 3,777,753
268 3,777,754
269 3,777,760
271 3,777,755
276 3,777,756
278 3,777,757
284 3,777,758
287 3,777,759
350R 3,777,761
419P 3,777,762
476 3,777,763
519 3,777,764

CLASS 131

187 3,777,765
243 3,777,766
257 3,777,767

CLASS 132

53 3,777,768

CLASS 133

8R 3,777,769

CLASS 134

2 3,778,309
118 3,777,770

CLASS 136

6LN Re.27,835
89 3,778,312
100R 3,778,310
120FC 3,778,311
3,778,313
176 3,778,314

CLASS 137

1 3,777,771
68 3,777,772
117 3,777,773
234.6 3,777,774
268 3,777,775
270 3,777,776
454.6 3,777,777
487.5 3,777,778
512.3 3,777,779
576 3,777,780
608 3,777,781
614.02 3,777,782
625.5 3,777,783
625.62 3,777,784
806 3,777,785

CLASS 138

109 3,777,786

CLASS 139

127R 3,777,787

CLASS 141

279 3,777,788
329 3,777,789
392 3,777,790

CLASS 144

28.72 3,777,791
82 3,777,792
220 3,777,793
324 3,777,794

CLASS 148

6.3 3,778,315
12 3,778,316
3,778,317
12.7 3,778,318

CLASS 149

92 3,778,319
109 3,778,320

CLASS 150

35 3,777,795

CLASS 151

38 3,777,796

CLASS 152

158 3,777,797
3,777,798
362R 3,777,799

CLASS 156

187 3,778,322
212 3,778,323
215 3,778,328
257 3,778,324
278 3,778,325
417 3,778,326
425 3,778,327
446 3,778,321

CLASS 160

84R 3,777,800

CLASS 161

39 3,778,340
47 3,778,329
67 3,778,330
3,778,331
87 3,778,241
95 3,778,337
156 3,778,334
159 3,778,332
164 3,778,335
168 3,778,336
169 3,778,333
192 3,778,338

CLASS 162

125 3,778,341
164 3,778,339
352 3,778,342

CLASS 164

337 3,777,801

CLASS 165

1 3,777,802
2 3,777,803
8 3,777,804
9.1 3,777,805
19 3,777,806
26 3,777,807
39 3,777,808
54 3,777,809
92 3,777,810
105 3,777,811

CLASS 166

6 3,777,812
72 3,777,813
212 3,777,814
247 3,777,815
260 3,777,816
274 3,777,817
3,777,818
285 3,777,819
305R 3,777,820

CLASS 169

2R 3,777,821

CLASS 172

33 3,777,822
328 3,777,823
801 3,777,824

CLASS 173

13 3,777,825

CLASS 174

3,778,526
42 3,778,527
48 3,778,528
52PE 3,778,529
65R 3,778,533
68.5 3,778,530
72R 3,778,531
74R 3,778,532
88C 3,778,534
3,778,535
121SR 3,778,536
138R 3,778,537
140R 3,778,538
152R 3,778,539

CLASS 175

46 3,777,826
103 3,777,827
140R 3,778,518

CLASS 176

3 3,778,343
22 3,778,344
24 3,778,347
36R 3,778,345
60 3,778,346
67 3,778,348

CLASS 177

165 3,777,828

CLASS 178

4.1B 3,778,540
5.2R 3,778,541
5.4R 3,778,542
3,778,543
6.6FS 3,778,559
6.6B 3,778,544
7.2 3,778,545
3,778,546
7.88 3,778,547
3,778,548
68 3,778,549
69.5R 3,778,550

CLASS 179

1E 3,778,551
1N 3,778,552
2DP 3,778,553
18AD 3,778,554
18FC 3,778,555
90K 3,778,556
3,778,557
100.2MD 3,778,558
100.2T 3,778,560
111E 3,778,561
111R 3,778,562
170R 3,778,563

CLASS 180

5R 3,777,829
3,777,830
3,777,831
3,777,832
6.48 3,777,833
9.44 3,777,834
10 3,777,835
26 3,777,836
70R 3,777,837
71 3,777,838
79.2R 3,777,839
82C 3,777,840
108 3,777,841
117 3,777,842

CLASS 181

.5VM 3,777,843
31B 3,777,844

CLASS 182

17 3,777,845
78 3,777,846

CLASS 184

1C 3,777,848
1R 3,777,847
6.12 3,777,849
6.15 3,777,850
63 3,777,851
103R 3,777,852

CLASS 187

9 3,777,853
29R 3,777,854
3,777,855

CLASS 188

65.1 3,777,856
170 3,777,857
181R 3,777,858
265 3,777,859
291 3,777,860
317 3,777,861

CLASS 190

43 3,777,862

CLASS 192

3.33 3,777,863
18B 3,777,864
70 3,777,865
88B 3,777,868
91A 3,777,866

CLASS 193

35A 3,777,867

CLASS 195

33 3,778,349
99 3,778,352
103.5C 3,778,350
105 3,778,353
127 3,778,351

CLASS 197

17 3,777,869
94 3,777,870
151 3,777,871

CLASS 198

20R 3,777,872
35 3,777,873
56 3,777,874
131 3,777,875
171 3,777,876
189 3,777,877
202 3,777,878
208 3,777,879
221 3,777,880

CLASS 200

5EB Re.27,836
5E 3,778,565
5R 3,778,564
14 3,778,566
50AA 3,778,568
50A 3,778,567
51.09 3,778,569
61.05 3,778,570
61.35 3,778,571
61.45M 3,778,572
144B 3,778,573
148B 3,778,574
153LA 3,778,575
166C 3,778,576
168G 3,778,577

CLASS 204

28 3,778,355
29 3,778,356
44 3,778,354
52R 3,778,357
55R 3,778,358
3,778,359
107 3,778,360
157.1R 3,778,361
159.15 3,778,364
254 3,778,362
290F 3,778,363

CLASS 206

1R 3,777,881
16S 3,777,882
45.31 3,777,883
56AB 3,777,400
62R 3,777,884
72 3,777,885

CLASS 208

111 3,778,365

CLASS 209

109 3,777,886
474 3,777,887

CLASS 210

23 3,778,366
51 3,778,367
54 3,778,368
130 3,777,888
135 3,777,889
150 3,777,890
3,777,891
178 3,777,892
321 3,778,369
499 3,777,893

CLASS 211

13 3,777,894
44 3,777,895
49D 3,777,896
55 3,777,897

CLASS 212

38 3,777,898
55 3,777,899
58R 3,777,900
58 3,777,901

CLASS 214

1BB 3,777,902
1BD 3,777,906
6B 3,777,904
6H 3,777,903
8.5D 3,777,913
8.5F 3,777,907
10.5R 3,777,905
16B 3,777,910
16R 3,777,908
16.4C 3,777,911
17C 3,777,909
55 3,777,914
82 3,777,915
83.3 3,777,917
138R 3,777,918
147G 3,777,919
152 3,777,912
314 3,777,920
450 3,777,921
3,777,922
506 3,777,923
519 3,777,916

CLASS 215

9 Re.27,837
3,777,924
11E 3,777,925

CLASS 219

10.55 3,778,578
69S 3,778,579
73 3,778,580
76 3,778,586
85 3,778,581
87 3,778,582
91 3,778,583
101 3,778,584
121LM 3,778,585
146 3,778,587
3,778,588
3,778,589
211 3,778,590
279 3,778,591
336 3,778,592
362 3,778,593
430 3,778,594

CLASS 220

29 3,777,926
85R 3,777,927
88B 3,777,928

CLASS 221

17 3,777,929
26 3,777,930
57 3,777,931
204 3,777,932
309 3,777,933

CLASS 222

3 3,777,934
16 3,777,935
48 3,777,936
70 3,777,937
185 3,777,938
189 3,777,939
193 3,777,940
207 3,777,941
309 3,777,942
385 3,777,943
394 3,777,944
3,777,945
402.2 3,777,946
402.23 3,777,947
497 3,777,948
541 3,777,949
554 3,777,950

CLASS 223

67 3,777,951

CLASS 224

2B 3,777,952
4C 3,777,953
19 3,777,954
35 3,777,955
45S 3,777,956

CLASS 225

4 3,777,958
50 3,777,957

CLASS 226

25 3,777,959
33 3,777,960
57 3,777,961
129 3,777,962
145 3,777,963
183 3,777,964
3,777,965

CLASS 227

61 3,777,966

CLASS 228

2 3,777,967

CLASS 229

7R 3,777,968
17R Re.27,838
37E 3,777,969
54R 3,777,970
68R 3,777,971

CLASS 233

20A 3,777,972

CLASS 235

61.11D 3,778,598
61.11E 3,778,597
61.12R 3,778,599
61.7B 3,778,595
61.9R 3,778,596
92C 3,778,600
144HC 3,777,973
150.26 3,778,602
150.27 3,778,601
151.12 3,778,603
152 3,778,604
154 3,778,605
156 3,778,606
193 3,778,607
194 3,778,608

CLASS 236

49 3,777,974

CLASS 237

12.3A 3,777,975

CLASS 239

1 3,777,981
64 3,777,976
96 3,777,977
171 3,777,978
177 3,777,979
272 3,777,980
315 3,777,982
422 3,777,983
533 3,777,984
3,777,986
542 3,777,987
553.3 3,777,988
555 3,777,985
567 3,777,989
571 3,777,990
656 3,777,991
689 3,777,992

CLASS 240

73BJ 3,778,610
73HA 3,778,609
108D 3,778,611

CLASS 241

15 3,777,993
24 3,777,994

CLASS 242

18DD 3,777,995
18R 3,777,996
55.53 3,777,997
56.2 3,777,998
68.4 3,777,999
77.2 3,778,000
84.5A 3,778,001
129 3,778,002
156 3,778,003
169 3,778,004
186 3,778,005
205 Re.27,839

CLASS 243

19 3,778,006

CLASS 244

3.14 3,778,007
17.11 3,778,008
42DA 3,778,009
121 3,778,010
137R 3,778,011

CLASS 248

119R 3,778,012
221 3,778,013
406 3,778,014
475R 3,778,015
3,778,016

CLASS 249

78 3,778,017
120 3,778,018
189 3,778,019
219R 3,778,020

CLASS 250

199 3,778,616
223B 3,778,617
223 3,778,618
225 3,778,619
232 3,778,620
251 3,778,612
303 3,778,613
324 3,778,622
325 3,778,623
333 3,778,624
362 3,778,614

442 3,778,621
444 3,778,625
475 3,778,615
492 3,778,626
499 3,778,627
556 3,778,628
557 3,778,629
3,778,630
572 3,778,631

CLASS 251

11 3,778,021
14 3,778,022
30 3,778,023
63 3,778,024
129 3,778,025
255 3,778,026
297 3,778,027
306 3,778,028
315 3,778,029
327 3,778,030

CLASS 252

34 3,778,371
42F 3,778,370
49.9 3,778,375
51.5A 3,778,372
62.56 3,778,373
62.62 3,778,374
78 3,778,376
82 3,778,377
91 3,778,378
171 3,778,379
301.1R 3,778,380
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Frederick B. Dent, Secretary